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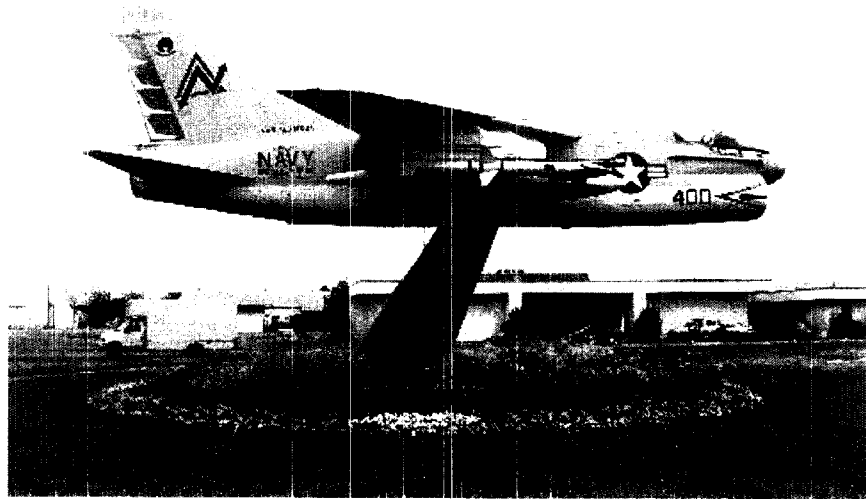
Historical Radiological Assessment

Volume II

Alameda Naval Air Station

Use of General Radioactive Materials, 1941-2005

June 2007



Prepared for

**Base Realignment and Closure
Program Management Office West
San Diego, California**

Prepared by

**Weston Solutions, Inc.
750 Dump Road
P.O. Box 2135
Vallejo, California 94592
WDCN 2033**

Prepared under

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NAVAL NUCLEAR PROPULSION PROGRAM
1966 – 1997
VOLUME I

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LIST OF ABBREVIATIONS, ACRONYMS, AND SYMBOLS

AEA	Atomic Energy Act
AEC	Atomic Energy Commission
AFES	Armed Forces Exchange Service
AIMD	Aircraft Intermediate Maintenance Department
Am-241	americium-241
A/R	assembly and repair
ARMCO	Aviation Resources Management Control
ARRA	Alameda Reuse and Redevelopment Authority
AUW	Advanced Underseas Weapon
AVGAS	Aviation gasoline
BCT	BRAC Cleanup Team
BEQ	bachelor enlisted quarters
bgs	below ground surface
BOQ	bachelor officer's quarters
BPMOW	BRAC Program Management Office West
BRAC	Base Realignment and Closure
BUAERO	Navy Bureau of Aeronautics
BUMED	Navy Bureau of Medicine and Surgery
BUSHIPS	Navy Bureau of Ships
C-14	carbon-14
CAE	Committee on Atomic Energy
CDHS	California Department of Health Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	CERCLA Information System
CEWRA	Civilian Employee Welfare and Recreation Association
CFR	Code of Federal Regulations
Ci	curie
CNO	Chief of Naval Operations
Co-60	cobalt-60
COMCARDIV	Commander Carrier Division
COMFAIR	Commander Fleet Air
COMNAVAIRPAC	Commander Naval Air Force, Pacific
cpm	counts per minute
CPO	Chief Petty Officer
CRC	Citizens Reuse Committee
Cs-137	cesium-137
Ctr	center

DCGL	derived concentration guideline level
DDOC	Deputy Director of Operations Command
DERP	Defense Environmental Restoration Program
DLA	Defense Logistics Agency
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
dpm/100 cm ²	disintegrations per minute per 100 square centimeters
DRMO	Defense Reutilization and Marketing Office
DTSC	Department of Toxic Substances Control
DU	depleted uranium
DVECC	Disease Vector Ecology and Control Center
EBMUD	East Bay Municipal Utility District
ECD	Electron Capture Detector
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ERDA	U.S. Energy Research and Development Administration
FAA	Federal Aviation Administration
FAETUPAC	Fleet Airborne Electronics Training Unit, Pacific
FASRON	Fleet Aircraft Service Squadron
FBI	Federal Bureau of Investigation
FFA	Federal Facility Agreement
FFSRA	Federal Facility Site Remediation Agreement
FISC	Fleet Industrial Supply Center
FLOG	Fleet Logistics
FMAG	Fleet Maintenance Assist Group
FS	Feasibility Study
FSS	Final Status Survey
GCA	ground control approach
GEMD	Ground Electronics Maintenance Division
G-RAM	general radioactive material
GSE	Government specified equipment
H-3	tritium
HPS	Hunters Point Shipyard
HRA	Historical Radiological Assessment
HRS	Hazard Ranking System
IAS	Initial Assessment Study
IR	Installation Restoration
IRO	Industrial Relations Office
K- 40	potassium-40
Kr-85	krypton-85
LOX	liquid oxygen
MAG	Marine Air Group

MARAD	Maritime Administration
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MARTD	Marine Air Reserve Training Detachment
MCL	maximum contaminant level
MWR	Morale, welfare and recreation
mrem/hr	millirem per hour
NACIP	Naval Assessment and Control of Installation Pollutants
NADEP	Naval Air Depot
NaI	sodium iodide
NAMT	Naval Air Maintenance Trainer
NARA	National Archives and Records Administration/ Naval Air Reserve Activity
NARDAC	Navy Regional Data Automation Center
NARF	Naval Air Rework Facility
NARTU	Naval Air Rescue Training Unit
NARU	Naval Air Reserve Unit
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NAVSEA	Naval Sea Systems Command
NAVTRANSCO	Naval Transportation Coordinating Office
Navy	U.S. Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEESA	Naval Energy and Environmental Support Activity
Ni-63	nickel-63
NIS	Naval Investigative Service
NISTARS	Naval Integrated Storage, Tracking and Retrieval System
NNPP	Naval Nuclear Propulsion Program
NORM	naturally occurring radioactive material
NPL	National Priorities List
NRC	U.S. Nuclear Regulatory Commission
NRDL	Naval Radiological Defense Laboratory
NRMP	Navy Radioactive Material Permit
NRSC	Naval Radiation Safety Committee
NSCO	Naval Supply Center, Oakland
NWSC	National Weather Satellite Center
O/R	overhaul and repair
PA	Preliminary Assessment
PCB	polychlorinated biphenyl
pCi/g	picocurie per gram
pCi/L	picocurie per liter

PFAVC	Pacific Fleet Audio-Visual Command
Pm-147	promethium-147
PO	Petty Officer
PP	Proposed Plan
PSNS	Puget Sound Naval Shipyard
Pu-239	plutonium-239
PWC	Public Works Center
Ra-226	radium-226
Ra-228	radium-228
RAB	Restoration Advisory Board
RADLAB	radiation laboratory
RASO	Radiological Affairs Support Office or Naval Sea Systems Command Detachment, Radiological Affairs Support Office
RASP	Radiological Affairs Support Program
RCRA	Resource Conservation and Recovery Act
RFI	ready for issue
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SEABEE	Navy Construction Battalion
SFBA	San Francisco Bay Aerodrome
SI	Site Inspection
SIMA	Shore Intermediate Maintenance Activity
Sr-90	strontium-90
SWDIV	Southwest Division, Naval Facilities Engineering Command
TACAN	Tactical Air Navigation (system)
Tc-99	technetium-99
Th-232	thorium-232
U-234	uranium-234
U-235	uranium-235
U-238	uranium-238
UO ₂	uranium oxide
USC	United States Code
USCG	United States Coast Guard Service
USFW	United States Fish and Wildlife Service
USGS	United States Geological Survey
USS	United States Ship
WO	Warrant Officer

GLOSSARY

AEC: Atomic Energy Commission. Federal agency created in 1946 to manage the development, use, and control of nuclear energy for military and civilian applications. The Energy Research and Development Administration (now part of the U.S. Department of Energy) and the U.S. Nuclear Regulatory Commission succeeded the AEC.

Aggregate: A clustered mass of individual soil products varied in shape and size (such as soils, sand, and rock).

Air: Atmosphere that becomes a migration pathway for resuspension and disposal of radioactive contamination and contaminated media.

Alpha particle: A positively charged particle ejected spontaneously from the nuclei of some radioactive elements. A thin sheet of paper can stop alpha particles.

Aquifer: A saturated subsurface zone from which significant quantities of water are drawn.

Background radiation: Naturally occurring radiation from cosmic or terrestrial sources.

Beta particle: A charged particle emitted from a nucleus during radioactive decay with a mass equal to 1/1837 that of a proton. Negatively charged beta particles are electrons, and positively charged particles are positrons. A thin sheet of plastic can stop beta particles.

Base Closure and Realignment Act of 1990: The Defense Base Closure and Realignment Act of 1990, as amended (Public Law 101-510), was enacted by the U.S. Congress to provide a fair process that will result in timely closure and realignment of military installations in the United States. The Navy uses the BRAC Program to comply with this Act.

Base Realignment and Closure (BRAC) Program: A formal Navy program managed by the Naval Facilities Engineering Command that was created in 1993 to dispose of excess Navy and Marine Corps properties, designated for closure or realignment by the U.S. Congress, by transfer to the local communities for reuse and economic revitalization.

BUMED: Navy Bureau of Medicine and Surgery. BUMED is responsible for the Navy's Radiation Health Program.

BUSHIPS: A former Navy bureau that was responsible for ships.

Byproduct Material: Any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material.

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980. Legislation that established the federal Superfund for response to uncontrolled releases of hazardous substances to the environment.

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Act Information System. U.S. Environmental Protection Agency's computerized inventory and tracking system for potential hazardous waste sites.

Characterization Survey: Site assessments generally taken after radioactive contamination has been confirmed in an impacted site by a scoping survey. The survey determines the extent of contamination, identifies, and defines the extent of radionuclides of concern. These surveys include in-depth surveys, sampling, monitoring, and analysis necessary to develop, analyze, and select appropriate cleanup techniques.

Check Source: The response of radiation detection instruments is checked using a check source. In many cases, the check source is attached to the instrument.

Class 1 area (based on the Multi-Agency Radiation Survey and Site Investigation Manual [MARSSIM]): An area having the highest potential for G-RAM contamination. Examples of Class 1 areas include (1) areas previously subject to remedial actions, (2) locations where leaks or spills are known to have occurred, (3) former burial or disposal sites, (4) waste storage sites, and (5) areas containing contaminants is discrete solid pieces of material with high specific activity.

Class 2 area (based on MARSSIM): An area having a moderate potential for G-RAM contamination. Examples of areas that might be reclassified as Class 2 include (1) locations where radioactive materials were present in an unsealed form, (2) potential contaminated transport routes, (3) areas downwind from stack release points, (4) upper walls and ceilings of buildings or rooms subjected to airborne radioactivity, (5) areas handling low concentrations of radioactive materials, and (6) areas on the perimeter of former contamination control areas.

Class 3 area (based on MARSSIM): An area having slight or no potential for G-RAM contamination. Examples of areas that might be classified as Class 3 include buffer zones around Class 1 and Class 2 areas and areas with very low potential for residual contamination but insufficient information to justify a non-impacted classification.

Class 1 survey: Surveys of an impacted site that has a high potential for radioactive contamination, is known to have contamination, or had a prior remediation to remove radioactive contamination. This includes areas with contamination in excess of release limits based on a scoping or Characterization Survey or areas where previous Class 2 or 3 surveys found contamination above the release limits. Class 1 surveys cover 100 percent of the site.

Class 2 survey: Surveys of an impacted site recognized as having a potential for radioactive contamination but the contamination is not expected to exceed release limits. This includes areas known to contain minor isolated areas of contamination with low potential for exposure, buffer zones around Class 1 areas, or areas where previous Class 3 surveys found contamination. Class 2 surveys can cover 10 to 100 percent of the site.

Class 3 survey: Surveys of an impacted site that is not expected to contain residual contamination exceeding the release limit. This includes buffer zones around Class 1 or 2 areas or previously decontaminated and surveyed areas. The percentage of the site covered by Class 3 surveys is not standardized, and surveys may be conducted randomly.

Conex box: A container express box. A basic steel container approximately 6 ft. by 6 ft. by 8 ft. The conex box discussed in this document was sometimes also referred to as a Sea-Land container and as the radium storage locker.

Contaminated media: Materials at an impacted site that contain, or are suspected of containing, radioactive contamination or to which radioactive contamination may have migrated.

Contaminated media assessment: A rating of the potential contamination media or migration at an impacted site.

Contamination potential: The possibility for residual radioactive contamination at an impacted site that has been determined through a professional evaluation of historical information, previous survey results, and site reconnaissance.

Curie: Abbreviated Ci. A unit of measure of the amount of radioactivity equal to 3.7×10^{10} disintegrations per second or 2.22×10^{12} disintegrations per minute (dpm).

Decontamination: The reduction or removal of radioactive material from a structure, object, or person. Accomplished by treating the surface to remove or decrease the contamination or by letting the material decrease as a result of radioactive decay.

Direct measurement: Measurement of alpha, beta, or gamma radiation. Data can be displayed as a digital rate, timed count, or integrated dose count.

Dose: The amount of energy absorbed by a person exposed to radiation.

Drainage system: Sanitary drains, facility storm drains, or septic systems and leach fields. This category can include bay sediments where drainage to the bay occurs.

Emergency action: Immediate remediation or containment is required because the levels of radioactive contamination or radiation exposure are such that there is a high potential for significant exposure or release of radioactive materials to the public or the environment.

EPA: U.S. Environmental Protection Agency. The lead federal regulatory agency under CERCLA for cleanup of hazardous waste sites on the National Priorities List (NPL).

FFA: A negotiated legal agreement between the Navy and EPA governing the CERCLA and RCRA administrative process for cleanup at NPL sites. The provisions of this agreement are factors in setting project execution priorities through risk management, and are tools for

formalizing commitments making selection of remedial action less adversarial. States may participate at their discretion.

FFSRA: A negotiated non-regulatory agreement governing the CERCLA and Resource Conservation and Recovery Act (RCRA) administrative process for cleanup at non-NPL sites. As with FFAs, provisions of FFSRAs are factors in setting project execution priorities through risk management and are tools for formalization of commitments, making selection of remedial action less adversarial.

Final Status Survey: Also stated as FSS. Assessment taken after historical documentation or previous investigations or remediations indicate radioactive contamination has been removed from an impacted site. The survey verifies that an impacted site complies with applicable release criteria by taking the appropriate measurements and sampling that will define the radiological condition of a site.

Free release: A recommendation made after historical documentation and previous and current investigations and surveys indicate all applicable release criteria have been met and the site is ready for review by Navy and regulatory agencies for future non-radiological use.

Gamma radiation: High-energy, short-wave length electromagnetic radiation emitted from the nucleus of an atom. Gamma radiation frequently accompanies the emission of alpha and beta particles and always accompanies fission. Gamma rays are stopped by shielding with heavy materials such as lead.

G-RAM: All general radioactive materials that are not associated with the Naval Nuclear Propulsion Program (NNPP).

Groundwater: Water contained in subsurface materials and aquifers.

Half-life: Time required for a population of atoms of a given radionuclide to decrease through radioactive decay to exactly one-half of the original number of atoms. No operation, either chemical or physical, can change the decay rate of a radioactive substance. Half-lives range from much less than 1 microsecond to more than 1 billion years. The longer the half-life, the

more stable the nuclide. After one half-life, half of the original atoms will remain; after two half-lives, one fourth (or $1/2$ of $1/2$) will remain; and so on.

Hazardous material: Material that possess properties of radioactivity, chemical toxicity, or other potential nuisance to cause human illness or injury.

Hazardous substance: Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive.

High: Contamination assessment indicating that evidence of contamination in the media or migration pathway has been identified.

HRA: Historical Radiological Assessment. A detailed investigation to collect historical radiological information and data derived from environmental monitoring for a particular site and its surroundings where radioactive materials were used. The HRA is comparable to the Historical Site Assessment as defined in MARSSIM.

HSA: Historical Site Assessment. MARSSIM terminology for an historical radiological assessment. See HRA above.

Impacted area: An area that has or historically had a potential for G-RAM contamination based on the site operating history or known contamination detected during previous radiation surveys. Impacted sites include sites where radioactive materials were used or stored; sites where known spills, discharges, or other instances involving radioactive materials have occurred; or sites where radioactive materials might have been disposed of or buried. Impacted sites are ranked as Class 1, 2, or 3 based on MARSSIM guidelines.

Investigation level: A radionuclide-specific level based on the release criterion that, if exceeded, triggers some response such as further investigation or remediation.

Known-Continued Access Contamination Potential: Low levels of contamination exist, but the contamination is contained in system, fixed on building surfaces, or is in generally inaccessible areas.

Known-Restricted Access Contamination Potential: Radioactive contamination is known to exist at levels that could be hazardous without protective clothing, respiratory protection, or radiation monitoring.

Likely Contamination Potential: Residual radioactive contamination is expected but has not been confirmed.

Low: Assessment of contaminated media or migration pathway indicating that the contamination potential is remote.

Media: Types of materials at an impacted site that may contain or are suspected of containing radioactive contamination or to which radioactive contamination may migrate.

Micro: Abbreviated μ . A prefix denoting one-millionth (10^{-6}).

Migration pathway: Media or transport mechanisms that allow radioactive contamination to spread in the immediate vicinity of the contaminated media.

Milli: Abbreviated m. A prefix denoting one-thousandth (10^{-3}).

Moderate: Assessment of contamination media or migration pathway that indicates the potential for contamination exists but has not been fully assessed.

None: Assessment of contaminated media or migration pathway that indicates evidence of contamination has not been found or known contamination has been removed and surveys indicate that the media or migration pathway meets release criteria.

NNPP: Naval Nuclear Propulsion Program. A joint Navy and U.S. Department of Energy program to design, build, operate, maintain, and oversee operation of naval nuclear-powered ships and associated support facilities.

Non-impacted area: An area having no reasonable possibility of residual G-RAM contamination resulting from site operations based on historical documents. Includes residential or other buildings that have or had no sealed radioactive sources other than smoke detectors or exit signs.

No Contamination Potential (None): Radioactive contamination has been fully assessed and removed, if necessary, and the Navy and the regulatory agencies have free released the site.

NPL: National Priorities List. Under the Superfund program, a list of sites of releases and potential releases of hazardous substances, pollutants, and contaminants that appear to pose the greatest threat to public health, welfare, and the environment.

NRC: U.S. Nuclear Regulatory Commission. An organization of the federal government that oversees and authorizes the use of byproduct, source, and special nuclear materials.

NRDL: Naval Radiological Defense Laboratory. A Navy command based at HPS from 1948 until 1969. The mission of NRDL was the study of nuclear weapons effects and the development of countermeasures to the atomic weapon and decontamination methods for ships from OPERATION CROSSROADS.

NRMP: Naval Radioactive Materials Permit. Site-specific or broad-scope Navy license for the use of specified radioactive materials under specified conditions. These permits are issued by the Naval Radiation Safety Committee (NRSC) under the authority of the Master Materials License granted to the Navy by the NRC.

NRSC: Naval Radiation Safety Committee. Navy organization providing administrative control of all NRC-licensed radioactive material used by the Navy and U.S. Marine Corps.

Nuclide: Any known isotope, either stable or unstable, of any element. A single element can have isotopes, but when referring to isotopes of more than one element, the proper term is nuclide.

Pico: Abbreviated p. A prefix denoting one-trillionth (10^{-12}).

Radiography: The process of examining a person, animal, object, or structure below the surface without injury or incursion using a radioactive source or a machine source of ionizing radiation.

Radioisotope: An unstable isotope of an element that decays or disintegrates spontaneously, emitting radiation. These elements have the same number of protons but different numbers of

neutrons in their nuclei. Approximately 3,700 natural and artificial radioisotopes have been identified.

Radioluminescence: Luminescence produced by the bombardment of radiant energy such as X-rays, radioactive waves, or alpha particles on a material such as phosphors.

Radioluminescent device: An item containing radioluminescent paint that allows the device to be seen in the dark. These devices were commonly used by the Navy and possibly contained radium (Ra-226), strontium (Sr-90), tritium (H-3), or promethium (Pm-147).

Radioluminescent paint: A paint containing a radioisotope that interacts with a phosphor to produce radioluminescence. The paint was commonly applied to devices that needed to be seen in areas without natural or artificial lighting.

Radionuclide: An unstable nuclide or isotope.

Radiologically impacted: An area, building, or piece of equipment that, under professional interpretation, has the distinct possibility of having residual radioactive material associated with it.

RASO: The Naval Sea Systems Command Detachment, Radiological Affairs Support Office, located in Yorktown, Virginia. RASO provides technical support to the Navy for management and control of G-RAM.

Release criterion: A regulatory limit established to set a limit for decontamination of residual radioactive contamination. The term may be expressed as a quantification of radioactivity, dose, or exposure risk.

Roentgen: A unit of exposure for x-rays or gamma rays.

Scoping Survey: A survey to identify radionuclide contaminants, relative radionuclide ratios and general levels, and extent of contamination. These surveys usually include minimal surface scans, sampling, and dose rate assessments.

Source: A small device containing radioactive material. The device may be used in research and industrial processes and may be sealed or unsealed. Sealed sources are often part of specialized industrial devices that measure quantities such as the moisture content of soil or the density or thickness of materials (radiography or NDT). Sources are usually enclosed in a housing that prevents the escape of the radioactive materials. Often referred to as “radioactive sources” or “sealed sources.”

Source Material: (1) Uranium or thorium, or any combination thereof, in any physical or chemical form or (2) ores which contain by weight one-twentieth of one percent (0.05%) or more of: (i) Uranium, (ii) thorium or (iii) any combination thereof. Source material does not include special nuclear material.

Special Nuclear Material: (1) plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the U.S. Nuclear Regulatory Commission, pursuant to the provisions of section 51 of the Atomic Energy Act, determines to be special nuclear material, but does not include source material; or (1) any material artificially enriched by any of the foregoing but does not include source material

Spectroscopy: Physics that deals with the theory and interpretation of interactions of matter and radiation. Often used in the analysis of samples for quantification or qualification of radioactive content.

Storm Drain System: A system generally containing concrete pipes ranging in size from 8-inch to 27-inch diameter. The storm drain system was installed throughout the NAS for the purpose of collecting rain and storm runoff and directing the runoff to the San Francisco Bay. At the time of radium use in Building 5 and the early years of radium use in Building 400, the drain lines in the buildings were connected directly to the storm drain system that empties into the seaplane lagoon.

Structure: A man-made surface(s) above the surface or contained within subsurface media.

Subsurface soil and media: Solid materials and media found below the surface soils.

Surface soil: The top layer of soil (from surface to 6 inches below ground surface), fill, gravel, waste piles, concrete, or asphalt that is available for direct exposure, growing plants, resuspension of particles for inhalation, and mixing from human disturbances.

Surface water: Waters found in streams, rivers, lakes, and oceans as well as coastal tidal waters.

Swipe sample: Type of sample collected to measure removable contamination on surfaces by alpha and beta particles.

TAC rags: A wiping rag coated with PCBs to aid in wiping up dust.

Undifferentiated Sedimentary Deposits: Sediments consisting of varying types of sands, clays, soils, and rocks resulting from storm wash and river erosion.

Unknown Contamination Potential: Residual radioactive contamination potentially exists but no clear indication of possible contamination levels or contaminants has been established.

Unlikely Contamination Potential: Residual radioactive contamination is not expected but investigation is warranted.

Weatherboard: A length of timber boarding (previously elm, but now typically pine or fir) fixed horizontally or vertically to the exterior of a structure.

Wetland: A type of sensitive environment sufficiently inundated or saturated by surface water or groundwater to support vegetation adapted for life under saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

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1.0 EXECUTIVE SUMMARY

1.1 PURPOSE

This document, entitled *Historical Radiological Assessment, Volume II, Alameda Naval Air Station, Use of General Radioactive Materials, 1941-2005*, presents a comprehensive history of radiological operations conducted by the U. S. Department of the Navy (Navy) and Navy contractors at the Alameda Naval Air Station (former NAS), Alameda, California, and at the Alameda Annex located adjacent to former NAS. Former NAS is located on the east side of the San Francisco Bay and consists of approximately 2,686 acres.

The Navy has prepared the Historical Radiological Assessment (HRA) as a two-volume set. Volume I, entitled *Historical Radiological Assessment, Naval Air Station Alameda, Volume I, Naval Nuclear Propulsion Program, 1966-1997 (ALA-HRA-1)*, was published in April 2000 and addressed radioactivity associated with the Naval Nuclear Propulsion Program (NNPP). Volume I concluded that “the berthing of and work on nuclear powered ships at NAS has had no adverse impact on the human population or the environment of the region.”

This document has been prepared pursuant to the Navy’s Installation Restoration (IR) Program, which encompasses the Navy’s Base Realignment and Closure (BRAC) Program, and in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). The format and content follow the guidelines for a Historical Site Assessment established in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (ALA-HRA-2).

Volume II describes the history of operations involving general radioactive material (G-RAM) that, for the purposes of this document, is defined as any radioactive material used by the Navy or Navy contractors not associated with the NNPP. The two volumes are written by different organizations and published separately because different Naval Sea Systems Command (NAVSEA) offices, with different historical controls and practices, manage NNPP radioactive material and G-RAM.

1.2 HRA METHODOLOGY

The primary purpose of the HRA is to designate sites as impacted or non-impacted. An impacted site has or historically had a potential for G-RAM contamination based on the site operating history or known contamination detected during previous radiation surveys. In many instances, designation as impacted does not confirm that radioactive contamination is present, only that the possibility exists and must be investigated. If contamination is found at a former NAS impacted site, measures will be taken to remove the contamination to below release levels. Once a site is designated as impacted, it remains “impacted” even after any residual contamination is removed.

A non-impacted site is one, based on historical documentation or results of previous radiological survey information, where there is no reasonable possibility for residual radioactive contamination. If new historical information becomes available or contamination is found at a non-impacted site, the site would be redesignated as “impacted”.

To designate sites as impacted or non-impacted, the HRA defines the extent of past radiological operations, assesses the likelihood of potential contamination and potential contamination migration pathways, and recommends future actions. As well as being used to designate impacted sites, this information can be used to support removal actions within the context of the U. S. Environmental Protection Agency’s (EPA) CERCLA process. As such, this HRA includes:

- Initial classification of areas that are impacted by radiological operations
- Historical information about radiological operations, investigations, and surveys
- Identification of potential, likely or known sources of radioactive material, radioactive contamination, and areas of use
- Assessments of the likelihood of areas of residual contamination
- Assessments of the likelihood of contamination migration

- Identification of sites that need further action as opposed to those posing no risk to human health or the environment from radiological operations
- Recommendations for future radiological investigations and remediation processes

The Navy researched multiple federal archives to obtain information for preparation of the HRA. Historical information was compared with evaluations made during site visits.

1.3 HISTORY

This HRA covers 64 years of radiological history at former NAS from 1941 through June 2005. Former NAS operations officially terminated on April 30, 1997.

This section briefly discusses the history of the Alameda Naval Air Station complex on Alameda Point, which stretched from the west end of Alameda Point, the site of the former Alameda Airport, to the former site of the San Francisco Bay Airdrome (SFBA), later the site of a portion of the Alameda Annex (Figure 1-1)



Figure 1-1 Old Alameda Airport, San Francisco Bay Aerodrome, and Proposed NAS Alameda 1940

In 1927, the City of Alameda built an airport at the western end of Alameda Point. This airport, Alameda Airport, had one east-west runway, three hangars, an administration building, and a yacht harbor. By 1930, the Army established a base at the airfield known as Benton Field.

At that time, Benton Field consisted of about 1,075 acres, of which only about 128 acres were above water. The City of Alameda continued to expand the property by dredging and filling.

In October 1936, the Navy acquired the title to the 1,075-acre site together with 929 acres (above and below water) which comprised the former Alameda Airport. The Navy spent over a year planning and designing the future air station. In February 1938, an officer of the Civil Engineer Corps arrived in Alameda to assume duties as Officer in Charge of Construction. The original plan was to construct a 1,000-man air station. Dredging created the deep-water pier facilities and turning basin planned for the aircraft carriers to be based at Alameda. Construction began on an administration building, barracks, mess hall, theatre, welfare building, public works garage and firehouse, assembly and repair shop, seaplane hangars, land plane hangars, lagoon and seaplane ramp.

NAS was commissioned on November 1, 1940. The Navy established the Overhaul and Repair Department (O/R), originally called the Assembly and Repair (A/R) Department, at about the same time as NAS was commissioned. The first building occupied by the A/R Department was Building 5 (Figure 1-2). Building 5 is the first known location on former NAS where radioactive materials were used in support of aircraft overhaul.

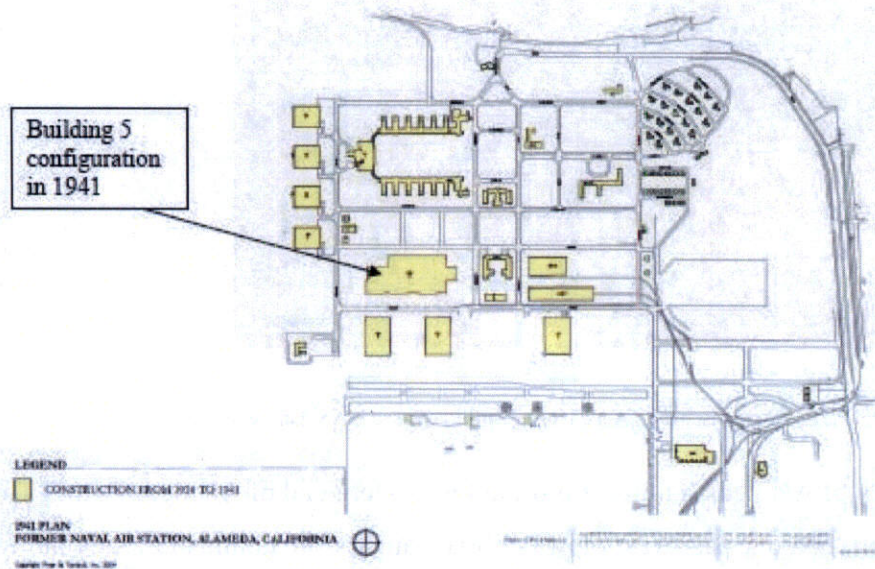


Figure 1-2 Building 5 Configuration in 1941

Alameda Annex is located just to the east of former NAS and consists of approximately 81 acres. This property became part of the Navy complex beginning in 1951 (Figure 1-3). The Alameda Annex includes both land and buildings utilized by the Defense Reutilization and Marketing Office (DRMO). Radioactive material awaiting disposition was discovered during a survey of the Alameda Annex DRMO facility in 1994.

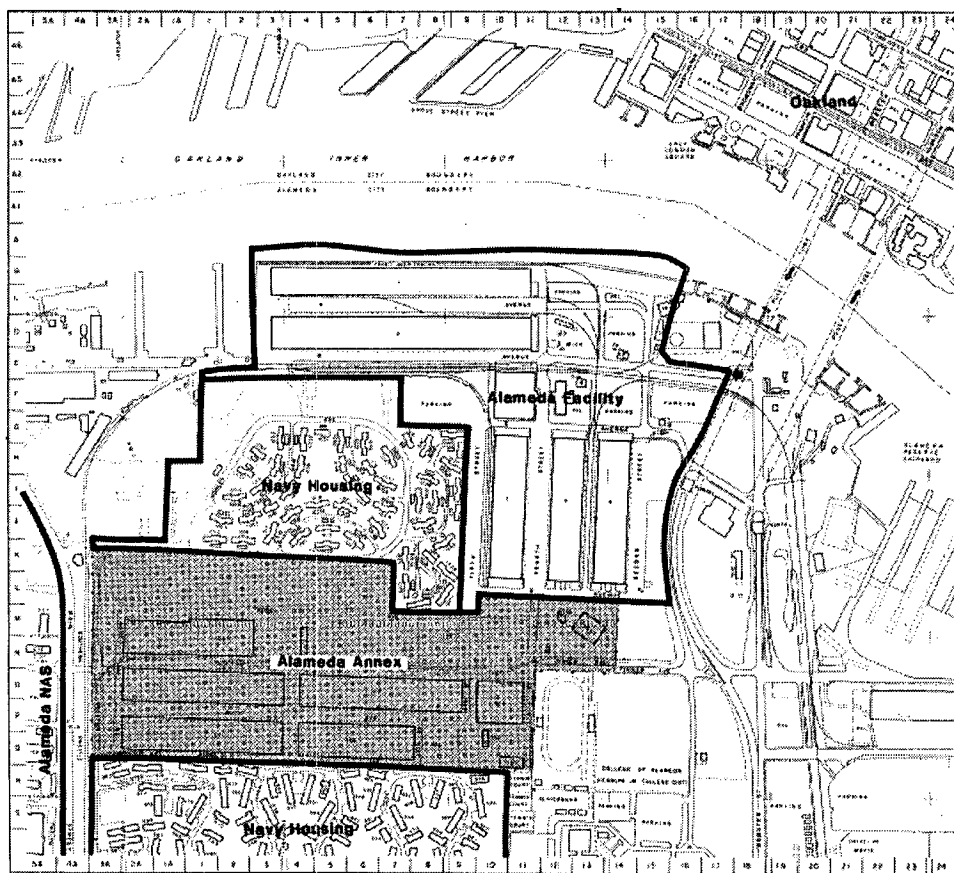


Figure 1-3 Alameda Annex

Details of the radiological history of former NAS and Alameda Annex are provided in Section 6.0. Historical radiological operations included the following:

- Overhaul and repair of aircraft instruments containing radium-226 (Ra-226) painted components (Buildings 5 and 400)

- Inspection, handling, storage, repair, and disposal of aircraft counterweights containing depleted uranium (DU) (Buildings 5, 12, 44, 309, 310, 400, and Alameda Annex)
- Operation of gas chromatography analysis equipment utilizing radioactive nickel-63 (Ni-63) (Buildings 7 and 42)
- Overhaul, and repair of electronic devices such as spark gap irradiators that utilize radioactive cesium-137 (Cs-137), cobalt-60 (Co-60), krypton-85 (Kr-85) or uranium oxide (UO₂) (Building 66 and 400)
- Disassembly, inspection and decontamination of aircraft engines that had been exposed to airborne radioactivity from nuclear weapons testing (Potentially Buildings 5, 66, and 113)
- Storage of radioactive material (Buildings 5, 114, 310, 346, Bunker 353, RadShack Area)
- Storage and handling of tritium (H-3) exit signs (Building 5, Bunker 497)
- Possible storage of nuclear weapons containing H-3 and enriched uranium-235 (U-235) (Bunker 497)
- Broken radioactive device (Pier 3)
- On-site disposal of radioactive materials (IR Site 1, IR Site 2, RadShack Area)
- Disposal of Ra-226 contaminated liquids via the storm drain system (Seaplane Lagoon, Seaplane Ramp and Parking Apron, Sanitary Drain System and Storm Drain System associated with Buildings 5 and 400)
- Recycling and reclamation of aircraft components (DRMO Scrapyard located in the Alameda Annex, former smelter)

Additionally, Mare Island Naval Shipyard used berthing facilities at former NAS between 1966 and 1995 for work on nuclear powered ships. These activities were reported in Volume I of the HRA (ALA-HRA-1).

1.4 REGULATORY INVOLVEMENT

The U. S. Nuclear Regulatory Commission (NRC) provided review and licensing of one radioactive material on former NAS (a sealed source of Ni-63 used in gas chromatographs). Additional uses of radioactive material on former NAS and Alameda Annex were not controlled by the NRC or the regulatory predecessor, the Atomic Energy Commission (AEC) but were controlled and regulated by the Navy. These uses included Naturally Occurring Radioactive Material (NORM), by-product material, and machines that generate radiation (x-ray equipment). Because x-ray equipment does not produce residual radioactive materials or contamination, further discussion of such equipment will not be included in this document except as included in the building use descriptions. Section 5.0 contains a complete review of the uses of radioactive material and of regulatory involvement. The types of radioactive material used at each site are detailed in Section 8.0.

1.5 ASSESSMENT SUMMARY

After a complete review of the radiological operations at former NAS and Alameda Annex buildings, structures and open areas, those with a history of radiological operations have been designated as “impacted sites.” This does not confirm the presence of radioactive contamination, but does indicate that there is the possibility for residual contamination. An assessment of contamination potential and contamination migration potential is provided in Section 8.0 for each of these sites with recommendations provided for future actions. In summary, this HRA has determined the following:

- Of 685 historical and current sites at former NAS and Alameda Annex, 23 sites are designated as “potentially impacted.” The potentially impacted sites are listed on Tables 3-3 and 3-4 and include buildings, disposal areas, Pier 3, Seaplane Lagoon, former building sites, outdoor areas, and sanitary and storm drain systems

- Six impacted sites (Buildings 7, 66 (ignition shop), 310, Bunker 497, Seaplane Ramp, and Pier 3) are recommended for review of the Final Status Survey (FSS). This indicates either that the sites were surveyed and no contamination was found or, if contamination was found, remediation has been completed and additional surveys found no contamination above release limits. These sites cannot be recommended for free release (any residual contamination is below today's release criteria) until the Navy and appropriate regulatory agencies have reviewed the FSS report and agreed with the assessment. Site-specific FSS reports are issued separately from the HRA
- One site (Building 42) is recommended for no further action based on the fact that the only identified source of radioactivity was a Ni-63 sealed source with no history of leakage of radioactivity
- Characterization Surveys or Final Status Surveys are recommended for seven sites (Buildings 44, 66 (main floor), 113, 114, 309, 346, and Bunker 353)
- Two sites, Hangar 12 and the Alameda Annex have been previously verified as meeting state and federal standards and have been approved for unrestricted release by the California Department of Health Services (CDHS). No further action is recommended for these sites
- Two impacted buildings (Buildings 5 and 400) are recommended for further investigation action or remediation
- Six impacted sites are recommended for further investigative action or remediation. These sites include: IR Site 1, IR Site 2, RadShack Area, Seaplane Lagoon, former Smelter, and Sanitary and Storm drain systems
- Potentially contaminated media include surface soils, subsurface soils, structures, and drainage systems
- No concern for airborne contamination exists from the potentially contaminated media in their present undisturbed state
- No impacted site is recommended for emergency action. Three sites IR Site 1, IR Site 2, and RadShack Area) are identified with known contamination that requires restricted access
- Only routine constraints to future remediation activities are recommended at this time because it is anticipated that future investigations will only find low-level concentrations of radioactive materials

The impacted sites are shown on Figure 4-1. Section 8.0 provides specific details for each impacted site, including site description, former uses, current uses, radionuclides of

concern, previous radiological investigations, and assessment of potential contamination, identification of potential contaminated media and potential migration pathways, and recommendations for future actions.

1.6 CONCLUSIONS

The overall conclusion of the HRA is that low levels of radioactive contamination exist within the confines of former NAS. The review of previous radiological activities, cleanup actions, and release surveys has not identified any imminent threat or substantial risk to tenants of former NAS or the local community.

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2.0 INTRODUCTION

This document presents a comprehensive history of radiological operations conducted by the Navy and Navy contractors at NAS. Closed in 1997 by the Navy, NAS comprises approximately 2,686 acres. It is located at the west end of Alameda Island in Alameda, California. Known over the years as Alameda Naval Air Station, Alameda Naval Air Rework Facility (NARF), and Alameda Naval Air Depot (NADEP), the acronym NAS, rather than the historical name appropriate for the referenced period, is used to identify the Station throughout this document.

To present a complete history of the use of radioactive materials at NAS, the Navy has prepared the HRA as a two-volume set. Volume I, entitled *Historical Radiological Assessment, Naval Air Station Alameda, Volume I, Naval Nuclear Propulsion Program, 1966-1997 (ALA-HRA-1)*, was published in April 2000 and addressed radioactivity associated with the NNPP. Volume I concluded that “the berthing of and work on nuclear powered ships at NAS Alameda has had no adverse impact on the human population or the environment of the region.”

This document, entitled *Historical Radiological Assessment, Volume II, Alameda Naval Air Station, Use of General Radioactive Materials, 1941-2005*, describes the history of operations involving G-RAM, which is defined as any radioactive materials used by the Navy and Navy contractors not associated with NNPP. The Radiological Affairs Support Office (RASO) manages the G-RAM program. The two volumes were written and published under the direction of two different NAVSEA offices because NNPP radioactive material and G-RAM are managed by different Navy offices and have different historical controls and practices.

2.1 SCOPE

Former NAS is located at the west end of Alameda Island, which lies on the east side of San Francisco Bay, next to the City of Oakland, California. The original site of the Naval Air Station consisted of 2,004 acres in three parcels obtained from the City of Alameda. The City of Alameda donated two of these parcels, consisting of approximately 1,075 acres of land and water, to the Government for the development of Benton Field for an Army Air Field. The third parcel, containing approximately 929 acres of land and water, comprises the west end of the

Naval Air Station. The entire original site included only approximately 300 acres of dry land. The remainder was under water. The original construction plans as authorized provided for the reclamation of approximately 880 acres, which includes the 300 acres of dry land. Subsequent acquisitions of adjacent property have increased the area of the station to 2,527 acres. In addition, the station occupies 159 acres of land and water at its southeast corner under a long-term lease from the City of Alameda (**ALA-HRA-3**). The mission of the air station was to provide facilities and support for the staging of fleet aviation activities, and for a Class "A" Aircraft Assembly and Repair establishment.

The Navy purchased Alameda Annex and Facility in two parts; the first being purchased in 1951 and the second in 1956 (**ALA-HRA-4**). The majority of the buildings were constructed in 1953.

This document, "*Historical Radiological Assessment, Volume II, Alameda Naval Air Station, Use of General Radioactive Materials, 1941-2005*," to be referred to as "NAS Alameda HRA, Volume II" throughout this document, describes the history of operations involving G-RAM in both former NAS and Alameda Annex.

2.2 HRA PURPOSE

The Navy uses HRAs to document the extent of past radiological operations at a specific site and the residual effects these operations may have had on the site. HRAs meet the protocol for a Preliminary Assessment (PA), as defined by the EPA's CERCLA guidance and can be used to support removal actions within the CERCLA process. The HRA also meets the definition of a Historical Site Assessment as defined by the MARSSIM (**ALA-HRA-2**).

The G-RAM operations conducted at former NAS included:

- Overhaul and repair of aircraft instruments utilizing radioluminescent paints containing Ra-226
- Inspection, handling, storage, repair, and disposal of aircraft counterweights containing DU
- Operation of gas chromatography analysis equipment utilizing radioactive Ni-63

- Overhaul, and repair of electronic devices such as spark gap irradiators that utilize radioactive Cs-137, Co-60, Kr-85 or UO₂
- Disassembly, inspection and decontamination of aircraft engines that had been exposed to airborne radioactivity from nuclear weapons testing
- Storage and handling of H-3 exit signs
- Possible storage of nuclear weapons
- On-site disposal of radioactive materials
- Disposal of Ra-226 contaminated liquids via the storm drain system
- Smelting of damaged or used aircraft parts and disposal of slag and waste products
- Screening of used, damaged, obsolete and excess equipment for scrapping or resale

All of the above operations are detailed in Section 6.0, History.

In addition to documenting the radiological history of a site, the Navy uses an HRA as a tool to assess the residual effect, if any, that radiological operations may have had on buildings, structures, and open land areas. Assessments for the potential presence of radioactive materials result in designation of buildings, structures, and open areas as “non-impacted” or “impacted” sites. Non-impacted sites are considered to have no reasonable potential for residual radioactive contamination. A designation of impacted means the history of the site indicates that radioactive materials may have been used, stored, or disposed at that location. At these sites, further investigation may be required to verify that the building or area is not contaminated, and that there is no potential for residual radioactive contamination at levels exceeding natural background, and current state and federal release standards. If further investigation and remediation of impacted sites are necessary, documentation of the activities will be presented in separate reports.

2.3 REGULATORY BACKGROUND

The information in the NAS Alameda HRA, Volume II is being presented pursuant to the Navy’s Installation Restoration (IR) Program, which encompasses the Navy’s BRAC Program. These programs function in accordance with CERCLA and SARA as directed by Executive

Order 12316 of 20 August 1981, which required the U.S. Department of Defense (DoD) to comply with CERCLA.

The Navy instituted the Naval Assessment and Control of Installation Pollutants (NACIP) Program in the mid-1980s as a method of complying with CERCLA. The first step in the NACIP Program was to conduct an Initial Assessment Study (IAS) to assess potential contamination by hazardous materials, including radioactivity. The former NAS IAS was completed in 1983 (**ALA-HRA-5**). Former NAS was placed on the EPA's National Priorities List (NPL) on July 22, 1999 (**ALA-HRA-6**). The Alameda Annex was not placed on the NPL.

In 1993, the U.S. Congress called for the closure and release of former NAS for reuse under the Base Closure and Realignment Act of 1988. Operational closure took place on 30 April 1997. A draft Federal Facility Site Remediation Agreement (FFSRA) was prepared for the State of California in 1993 but was never signed (**ALA-HRA-7**). When former NAS Alameda was placed on the NPL, the requirement for an FFSRA was replaced with the need for a Federal Facility Agreement (FFA), which is between the Navy and EPA. The FFA, which establishes guidelines on how to settle disputes and provides for an enforceable schedule, was signed in 2001 (**ALA-HRA-6**). The Alameda Annex is not on the NPL; therefore, an FFSRA was signed in 1992 for that facility. A new FFSRA for the Alameda Annex was signed in 2000 (**ALA-HRA-8**). DoD has the authority to undertake CERCLA actions under Title 42 of the *United States Code* (USC), Section 9604; Title 10 of the USC, Section 2705; and Federal Executive Order 12580. Under the authority of CERCLA, DoD has undertaken the assessment of radioactive materials at former NAS by conforming to the requirements of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Title 40 of the *Code of Federal Regulations* (CFR), Part 300. Because CERCLA defines radionuclides as hazardous substances, radionuclides are included in the CERCLA process to investigate, characterize, and remediate contamination. Appendix B of Title 40 of the CFR, Part 302.4 lists the specific radionuclides defined as CERCLA hazardous substances. All of the radionuclides previously used at former NAS are included on this list (**ALA-HRA-9**).

The MARSSIM (**ALA-HRA-2**) is a consensus document of the EPA, DoD, the U.S. Department of Energy (DOE), and the NRC. MARSSIM provides detailed guidance for

investigation of radiologically impacted sites. Developed to be consistent with CERCLA, MARSSIM uses a single-phase approach to address radioactive contamination issues versus CERCLA's multi-phased approach, that is, Site Inspection (SI), Remedial Investigation (RI), and Feasibility Study (FS). Once the presence of radioactive material has been identified and remediated at impacted sites, MARSSIM recommends a Final Status Survey (FSS) for radiological release of a site for unrestricted use to fulfill the CERCLA closure and post-closure process. Section 8.0 provides the status of each impacted site with the appropriate recommendation to comply with MARSSIM.

2.4 REPORT ORGANIZATION

The NAS Alameda HRA, Volume II is organized to present the history of Navy radiological operations from 1941 through June 2005 at former NAS, by providing the following information:

- Potential, likely, or known sources of G-RAM
- Potential, likely, or known areas of G-RAM use
- History of G-RAM operations, investigations, remediations, and surveys
- Classification of an area as impacted or non-impacted by radiological operations
- Identification of potentially contaminated media
- Assessments of the likelihood of contamination migration
- Assessment of risk to human health and the environment
- Information useful to radiological scoping and characterization surveys
- Recommendations for future radiological investigations and remediation processes

The basic organization of the report is listed below. Individual tables and appendices are not included here, but are listed in the Table of Contents. Figures are presented after their first mention in the text of the NAS Alameda HRA, Volume II; tables are presented after their respective sections, and appendices are presented after Section 10.0. Section 10.0 lists the reference documents used to prepare this HRA. The actual documents are provided separately on a compact disc.

List of Abbreviations, Acronyms, and Symbols

Glossary

Section 1.0 – Executive Summary

Section 2.0 – Introduction

Section 3.0 – Site Identification and Description

Section 4.0 – HRA Methodology

Section 5.0 – Regulatory Involvement

Section 6.0 - History

Section 7.0 – Assessment of Impacted Sites

Section 8.0 – Findings and Recommendations

Section 9.0 – Conclusions

Section 10.0 – References

Tables

Figures

Appendices

3.0 SITE IDENTIFICATION AND DESCRIPTION

Former NAS is located on Alameda Island, which lies at the west end of the City of Alameda in Alameda County, California. The U.S. Army provided the original development of the base in 1930 and the base was transferred to the Navy in 1936. Former NAS is close to the geographic center of the San Francisco-Oakland Metropolitan Area (Figure 3-1). This section details the geological and physical site characteristics and the current and historical information for former NAS and immediately adjacent areas.



Figure 3-1 San Francisco Bay Area

3.1 SITE DESCRIPTION

Former NAS consists of approximately 2,686 acres of land, water, and airspace easement. The NAS is roughly rectangular in shape, a little over 2 miles long by 1 mile wide. See Figure 3-2 for a map of the former NAS.

June 2007

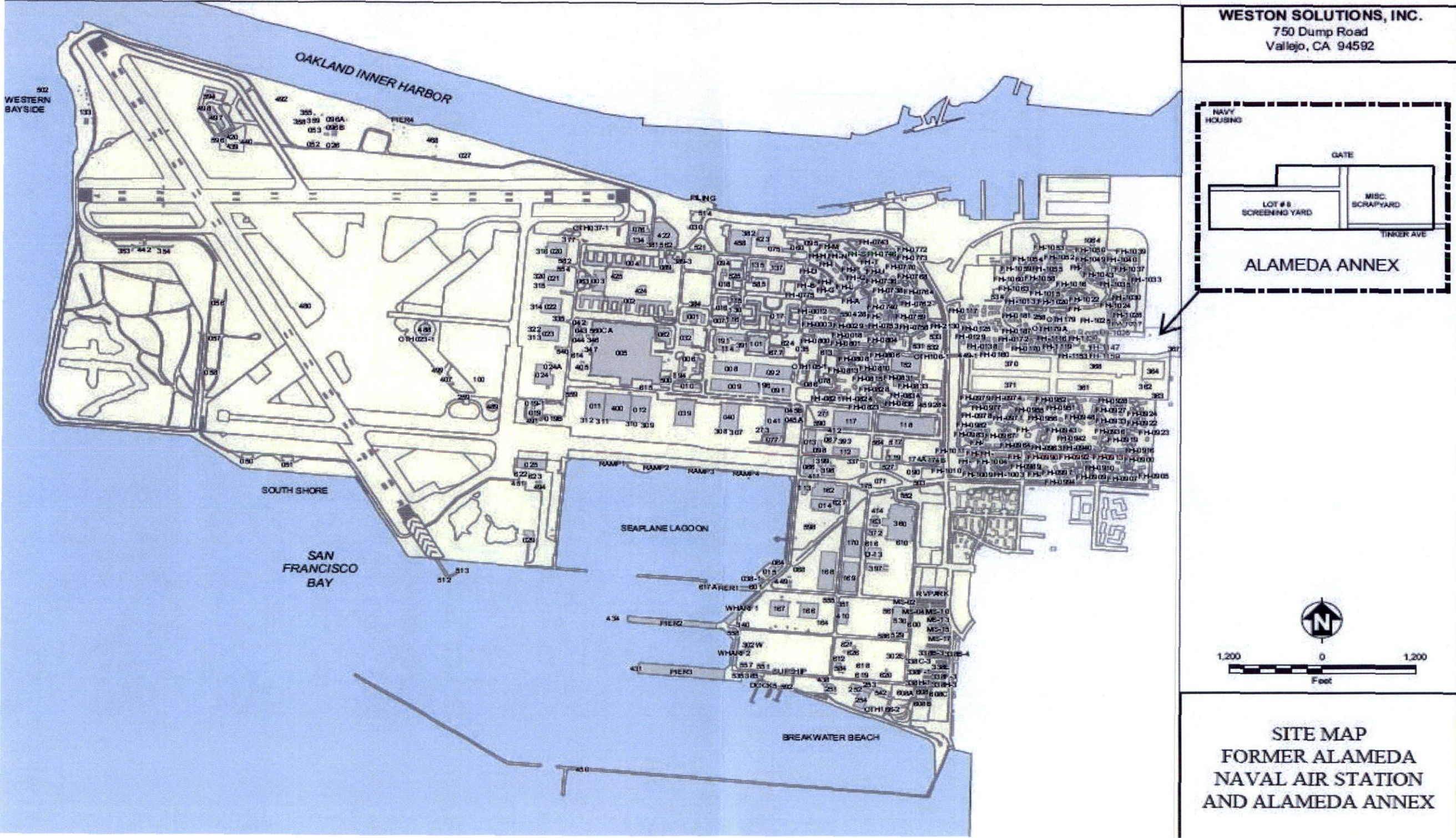


Figure 3-2 Site Map, Former NAS

The 2,561 acres owned in fee include 958 acres of water. Also included in the total are approximately 125 acres of aviation easement acquired from the Port of Oakland. Former NAS is situated on an island. Access by land transportation is via the Webster Street and Posey Tubes (underwater tunnels) or by one of several bridges at the southeast end of the island.

For purposes of CERCLA, the Naval Station is identified as:

Alameda Naval Air Station (Former NAS)

West End Alameda, California, 94501

EPA Region IX

CERCLA Information System (CERCLIS) Identification No. CA2170023236 (**ALA-HRA-10**)

Alameda peninsula was originally connected to the Oakland mainland. The build-up of Alameda Point as we know it today happened over an extended period of time. The San Francisco and Alameda Railroad was constructed in 1864. The railroad ran from High street in Oakland to the west end of Alameda ending in a ferry landing at the present site of Pier 2 (Figure 3-3).

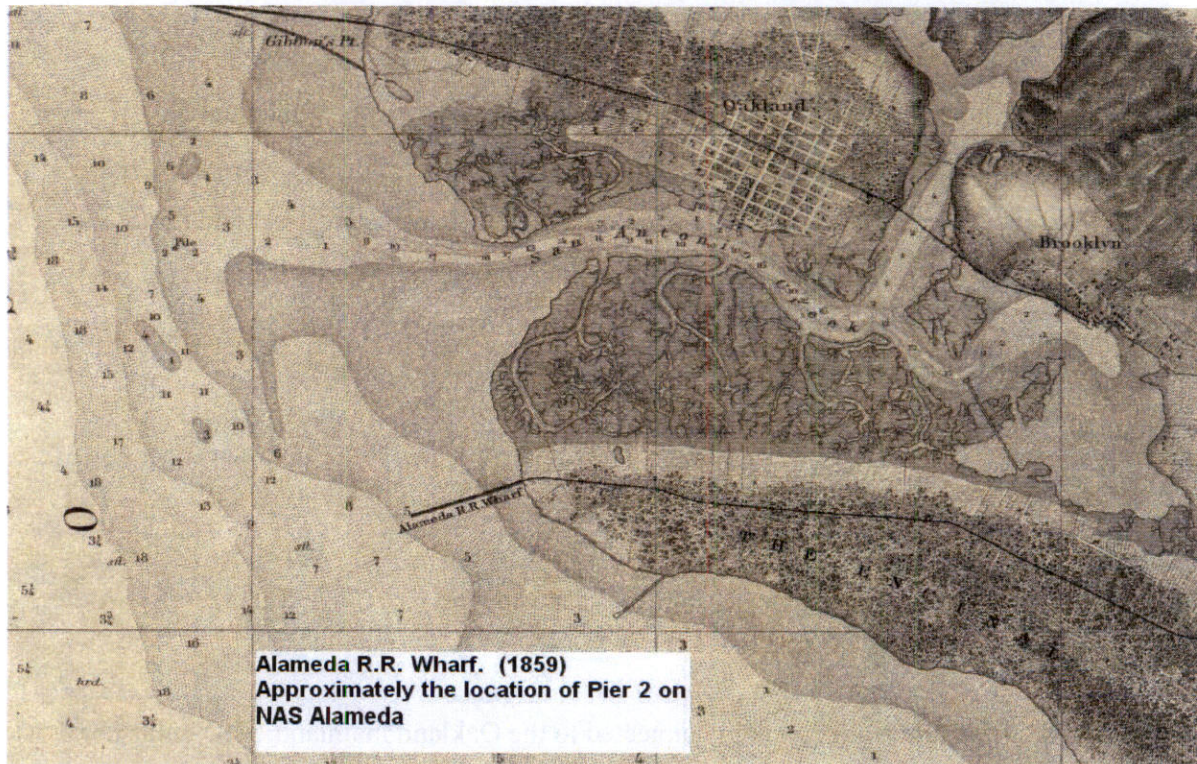


Figure 3-3 Alameda Railroad Wharf 1859

In 1876, work was begun to cut a channel through the peninsula thus creating Alameda Island (ALA-HRA- 11). The channel was completed in 1902 (ALA-HRA-12). In 1927, the city of Alameda established an airport that consisted of one narrow east-west runway. To the southwest of the field, the city established a yacht harbor. The U.S. Army provided the original development of the base in 1930 and the base was transferred to the Navy in 1936. The original plan was to construct a 1,000-man air station. Dredge material was used to create the land that was needed for the air station. Dredging was also utilized to create the deep-water pier facilities and turning basin planned for the aircraft carriers to be based at Alameda. The dredge and fill operations also created the land that was used for construction of additional runway area and taxiway area. Some of the land created is now known as IR Site 1, IR Site 2, and the wetlands of IR Site 2. Construction in the late 1930s included an administration building, barracks, mess hall, theatre, welfare building, public works garage and fire house, assembly and repair shop, seaplane hangars, land plane hangars, lagoon and seaplane ramp (ALA-HRA-11). See Appendix A for a pictorial history of the development of Alameda Point.

The Navy purchased Alameda Annex land in two parcels. Approximately 68 acres were purchased in December 1951. An additional 13 acres were obtained in June 1956. In 1980, the Annex and Facility (additional warehouses to the north of the Annex) were transferred to the Naval Supply Center, Oakland (NSCO). The Navy used the Annex and Facility for receiving, storing, and issuing aviation materials (ALA-HRA-4). The DRMO leased about 9 acres of asphalt and dirt surfaced storage space in the northeast portion of the Annex. This is the area known as the DRMO scrapyard. The area included Buildings 365, 366, and 367.

3.2 GEOLOGICAL SETTING

The Bay was dry land during the ice ages when the sea level dropped more than 300 feet as water accumulated in the great continental glaciers. The Sacramento River picked up several tributaries as it flowed through the coastal lowland, and then through the last mountain ridge in a deep canyon, that is now the Golden Gate Strait. Coastal lowlands filled with water as sea level rose at the end of the last ice age. The Bay assumed its present form about 10,000 years ago, when sea level returned to its present stand.

Alameda Point was formed by the natural process of beach sand deposits. Also identified as the Merrit Sand Formation, this deposit is classified as a fine-grained, well-sorted sand interspersed with layers of clayey sand and clay. The former tidal flats of the Oakland estuary and the bay bottom surrounding Alameda are more recent geological deposits of very fine materials held in suspension in bay water and gently deposited. These soils are known as "bay mud" (ALA-HRA-5).

3.3 GEOLOGY

Ever since the rising sea level flooded the Golden Gate Strait and converted the lower part of the river valley into what is now known as San Francisco Bay, the Sacramento and San Joaquin Rivers have been filling the Bay with sediment. This is because early mining operations in the Sierra Nevada Mountains started billions of cubic yards of sediment moving down the rivers. More than a billion cubic yards of that sediment have now reached the Bay. It is estimated about 8 million cubic yards of sediment wash into the Bay every year (ALA-HRA-13).

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The Bay is about 55 miles long from north to south and 3 to 12 miles wide, an area of about 435 square miles. At its deepest part, the Bay is about 350 feet deep, but more than 80 percent is less than 12 feet deep. The Bay is made up of brackish water that is about 2.8 percent dissolved salts, 15 percent less than normal seawater, which flows in and out with the tides. An average cycle of rising and ebbing tide moves enough water through the Golden Gate Strait to flood about 1.25 million acres to a depth of 1 foot. Incoming currents reach speeds as great as 4 miles per hour; outgoing flow is much slower (ALA-HRA-13).

Alameda Island is overlain with man-made fills dredged from the estuary. These types of deposits are plastic, unstable, and relatively weak. The original swamp areas consisted of deep deposits of bay mud interspersed with numerous drainage channels, marshlands and sloughs. The dredging fill soils range from low to moderate in compressibility, while the underlying bay mud is high in compressibility. The surface elevation varies from mean sea level to approximately 30 feet with an average elevation of approximately 20 feet (ALA-HRA-5).

Former NAS was built on land created by placing fill over marginal lands. The fill came from many places, including material dredged from the estuary during construction of the Posey Tube in the 1920s. Most of the station area is overlaid with silty sand and sand fill 6 to 8 feet thick. Beneath the fill, soft silt clay (bay mud) extends to depths of 25 to 120 feet below the ground surface. The soil below the bay mud is loose to dense silty and clean sands and stiff to very stiff sandy clays. Bedrock depth at former NAS is not known but has been encountered at a depth of 433 feet approximately a mile to the northwest (ALA-HRA-5).

The soils on the station are predominately coarse textured and have a low water holding capacity. Except for a small area on the west side next to the San Francisco Bay, the soils are well drained. In the poor drainage area, the soils are medium textured and are affected by moderate amounts of alkali and salts. The soil depth ranges from 20 to 60 inches. Over the coarse-textured sand and bay mud lies an imported 4-to 6-inch layer that is loam in texture.

There is no evidence of any fault traversing the site. However, the site is located approximately 6 miles west of the Hayward Fault and about 12.5 miles east of the San Andreas Fault (ALA-HRA-5). Figure 3-4 shows the location of active fault systems surrounding the

area. Both the Hayward Fault and the San Andreas Fault are considered active and have been the cause of major earthquakes in the past. During the Loma Prieta Earthquake on 17 October 1989, structural damage at NAS was sustained costing more than \$37 million to repair. Other significant faults include the Calaveras fault approximately 50 miles to the southeast, the San Gregorio-Seal Cove fault 24 miles to the west, the Rodgers Creek fault approximately 40 miles to the north, and the Maacama fault approximately 100 miles to the north. There are several lesser-known faults within approximately 60 miles (ALA-HRA-14).

3.4 HYDROLOGY

3.4.1 Surface Water

There are no natural surface streams or ponds on former NAS. The average annual precipitation is about 20 inches, of which, approximately 4 inches can be expected to infiltrate into the soil and yield an average groundwater underflow to the San Francisco Bay and the Oakland inner harbor channel at an average rate of 15 gallons per day per foot of shoreline (ALA-HRA-5).

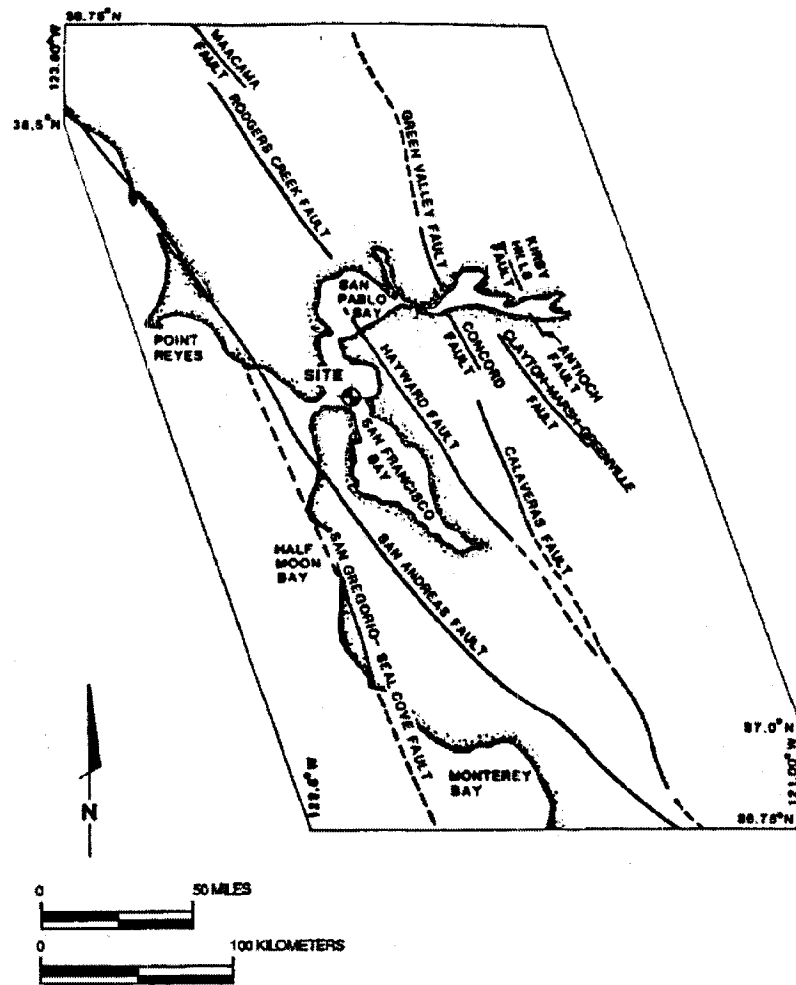


Figure 3-4 Major Earthquake Fault Systems Surrounding Former NAS (ALA-HRA-14)

3.4.2 Groundwater

Soil investigations conducted at various locations on the base have shown that the groundwater table at former NAS occurs generally at elevations of 4 to 8 feet above the lower low tide elevation. This elevation, or greater than the average tidal elevation, is maintained only because some precipitation infiltrates to the water table (ALA-HRA-5).

Tidal effects on water table fluctuation are not significant, except within 25 to 50 feet of the shoreline or other water surfaces connected to the bay, such as flooded or leaking sewers.

For a time period of 6 hours (approximate time interval between high and low tide), the calculated flow distance of the tidal water is approximately 35 feet (**ALA-HRA-5**).

Former NAS is underlain by a thick aquitard sequence of the bay mud formation, which is a silty clay. The underlying formations contain some sand units that have served as aquifers in the past. The January 2006 Lamphier-Gregory **Northern Waterfront Amendment** for Alameda Island indicates that overpumping of water wells on Alameda Island resulted in saltwater intrusion to the extent that most wells were closed by 1900. Only minor pumping of groundwater from the aquifer underlying Alameda Island has occurred since that time (**ALA-HRA-15**). The Navy has taken the position that the majority of water beneath Alameda NAS is too salty to ever be used for drinking water (**ALA-HRA-16**). Furthermore, according to the East Bay Municipal Utility District (EBMUD), no groundwater wells are used for water supply on Alameda Island (**ALA-HRA_5**) but are known to be used for backyard gardening and/or landscape irrigation..

3.4.3 Water Migration Potential

The former NAS potential surface water and groundwater migration pathways lead to San Francisco Bay and the Oakland Inner Harbor. Surface waters on the base reach the bay waters either by way of the storm water run-off system or sheet runoff and small rivulet channels. Any contaminants dumped into these systems will eventually reach the bay (**ALA-HRA-5**).

3.4.4 Climate and Meteorology

In general, the climate of the area is marine and characterized by very little change in temperature. Prevailing winds are from a westerly direction and gale force winds occur only rarely. Heavy fogs occur on the average of 21 days per year, impairing visibility for navigation an average of less than 100 hours per year. Freezing temperatures rarely occur and no snow or icing conditions are encountered. Rainfall averages approximately 20 inches annually, generally occurring between October and April. (**ALA-HRA-5**)

3.5 ADJACENT POPULATION

The 2000 Census reported 33,871,648 people in California, with approximately 7.5 million residing in counties within a 50-mile radius of former NAS. The metropolitan areas of San Francisco, Alameda, Contra Costa and Santa Clara Counties contain most of this population. The distribution of this population is shown in Table 3-1 (ALA-HRA-17). The population in cities within a 10-mile radius of former NAS is shown in Table 3-2 (ALA-HRA-17). Currently there is no established population on former NAS other than limited commercial and residential leasers.

3.6 PAST, CURRENT AND FUTURE FORMER NAS USAGE

Beginning with the early years of former NAS, the Navy has leased some NAS buildings to Navy-related entities for various uses. Examples of uses included aircraft maintenance and repair, shipping and receiving, munitions storage, and gasoline services. Former NAS was homeport to eight Naval Air Reserve Units (NARU) and Marine Air Group (MAG) Squadrons, and accommodated a significant number of transient aircraft in addition to its own squadrons. The Weapons Department coordinated ordnance disposal with the Explosive Ordnance Detachment. The Navy Exchange operated several gasoline service stations on the base. The Supply Department performed a number of duties in addition to those in support of the NAS. These included providing services for loading Air Force and Army aircraft on aircraft carriers, Military Sealift command and commercial vessels (ALA-HRA-5).

Table 3-3 summarizes the identified buildings, structures, and areas formerly and currently located on former NAS. The table lists the current and former uses and tenants as applicable. Many of the buildings had multiple uses over the life of the facility. Table 3-4 shows the chronological history of use of former NAS buildings and sites.

Several alternative scenarios are under review for development of the former NAS and the future uses of the buildings, structures and areas. All scenarios include some combination of residential, industrial, commercial, and recreational use.

Figure 3-5 shows the proposed future reuse of former NAS (ALA-HRA-18).

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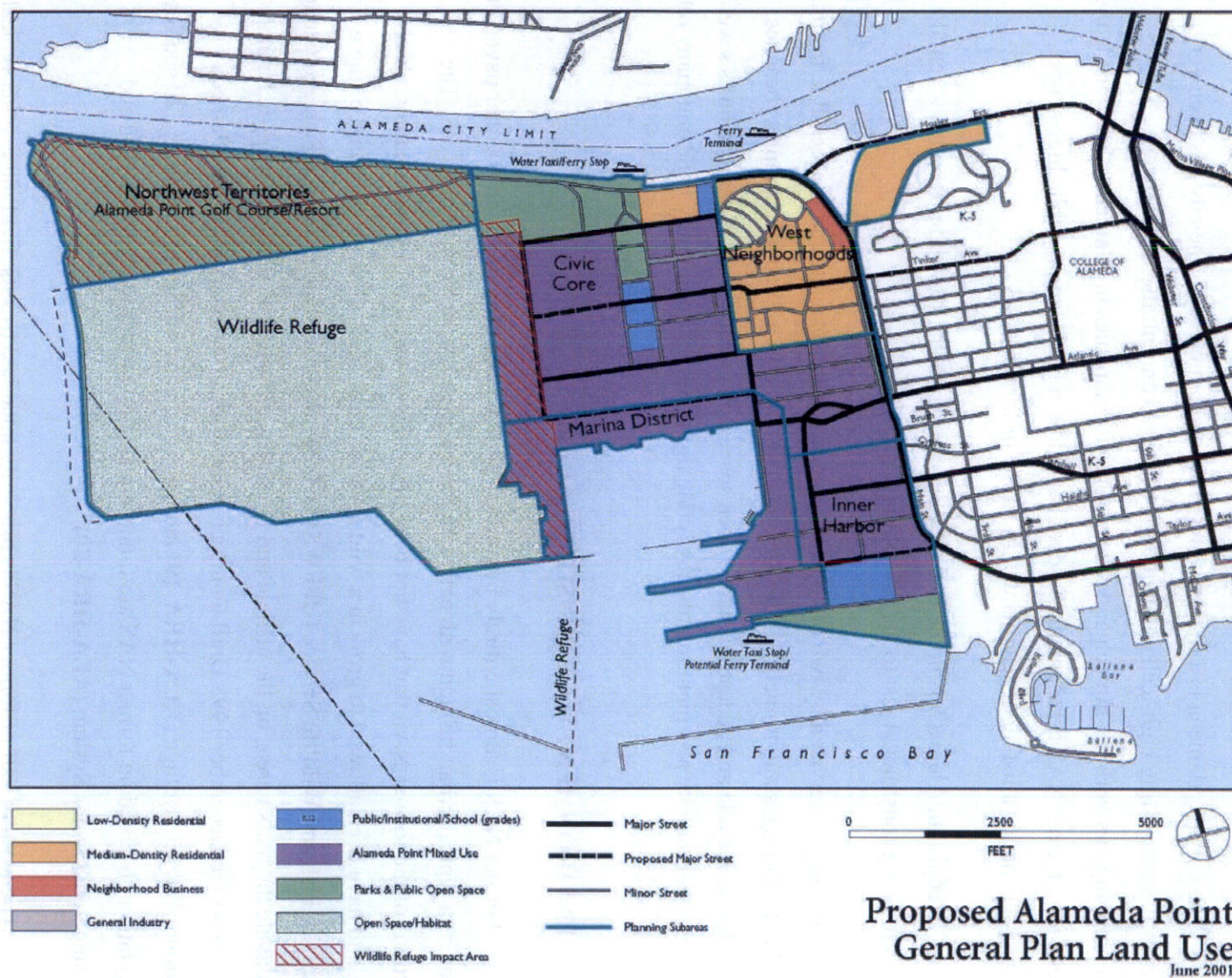


Figure 3-5 Proposed Land Use, Alameda Point (ALA-HRA-18)

3.7 ADJACENT LAND USAGE

The City of Alameda is a dynamic and growing community. The city has been very successful in attracting high-tech companies. There is a concentration of software, programming, networking, biotech and related service companies in Alameda. Just outside the gates of the former NAS are elementary schools, middle schools, and a public high school. Table 3-5 contains a listing of schools within 1 mile of former NAS.

In addition, Alameda is home to the College of Alameda. New homes and new rental units are being constructed just to the east of the former NAS.

The city is serviced by two bus systems and two ferry systems, and is accessible from the mainland by bridges and tunnels. There are numerous parks, a golf course complex, beaches, bird refuges, bicycle and pedestrian paths, open spaces, and waterfronts. Alameda hosts several of its own community arts including theatre, civic light opera, a community band and many other cultural activities.

3.8 ENVIRONMENTALLY SENSITIVE AREAS

Former NAS is almost entirely man-made land, the majority of which is either paved or planted in typical urban fashion with native and non-native lawns, trees, shrubs, etc. The portions of the former NAS that have not been planted with native or non-native trees, shrubs, etc. and have been allowed to grow in a wild state are those located on the west end of the island. The U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game designate the marsh areas on the airfield and landfill as existing and potential wildlife habitat. Review of the December 1998 Draft Comprehensive Conservation Plan for the Alameda National Wildlife Refuge (**ALA-HRA-19**) indicates that none of the approximately 20 species of vegetation observed on former NAS are found in the listing of USFWS Threatened and Endangered Species System (**ALA-HRA-20**).

The western half of former NAS is primarily inhabited by rats, field mice, other typical rodents, and jackrabbits. Terrestrial and aquatic ecosystems occur on or near former NAS.

In addition to the abundant rodent and rabbit population at former NAS, a variety of waterfowl and shorebirds feed and rest in the seaplane lagoon seasonally. The shorebirds utilize the exposed rock and limited mud areas, feeding on worms, crustaceans, mollusks, and smaller fish. The two wetlands located on the west end of the island provide the largest nesting and breeding grounds in northern California for the endangered California least tern (**ALA-HRA-5**). Other endangered or threatened species which have been observed on former NAS are the western snowy plover (threatened), the American peregrine falcon (proposed for de-listing), and the stellar sea lion (endangered – not observed in recent years) (**ALA-HRA-19**). In addition, the endangered brown pelican roosts on the island breakwater. There are no other rare or endangered animal species with habitats at former NAS (**ALA-HRA-5**).

The waters adjacent to former NAS are home to many species of fish, several of which have commercial and recreational value. The bay contains large numbers of shellfish species, such as soft-shell clams, mussels, oysters and Japanese littleneck clams. Although considerable progress has been made in improving water quality in the bay in recent years, shoreline waters are apparently not yet free enough of sewage contamination for the State Public Health Department to sanction harvesting of bay shellfish for consumption. Threatened or endangered fish in the San Francisco Bay listed under the Endangered Species Act include (**ALA-HRA-21**):

- Sacramento River winter-run Chinook salmon
- Central California Coast Coho salmon
- Central Valley spring-run Chinook salmon
- Central California Coast steelhead
- Central Valley steelhead

Examples of commercial and/or recreational fish that exist adjacent to former NAS are herring, halibut, striped bass, perch, smelt and rockfish. Based on the information listed above, none of the rare or endangered fish species in San Francisco Bay reside for extended periods of time or breed in proximity to former NAS (**ALA-HRA-5**).

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SECTION 3

TABLES

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TABLE 3-1 POPULATION OF COUNTIES ALL OR PARTIALLY WITHIN A 50-MILE RADIUS OF FORMER NAS		
County	1990 Population	2000 Population
Alameda	1,276,702	1,443,741
Contra Costa	803,732	948,816
Marin	230,096	247,289
Napa	110,765	124,279
San Francisco	723,959	776,733
San Joaquin	480,628	563,598
San Mateo	649,623	707,161
Santa Clara	1,497,577	1,682,585
Santa Cruz	229,734	255,602
Solano	339,471	394,542
Sonoma	388,222	458,614
Total Population	6,370,509	7,602,960

Source – (ALA-HRA-17)

TABLE 3-2 POPULATION OF CITIES WITHIN A 10-MILE RADIUS OF FORMER NAS (Greater than 10,000 Population)		
City	1990 Population	2000 Population
Alameda	73,979	72,259
Albany	16,327	16,444
Berkeley	102,724	102,743
Daly City	92,088	103,621
El Cerrito	22,869	23,171
Oakland	372,242	399,484
Orinda	16,642	17,599
Piedmont	10,602	10,952
Richmond	86,019	99,216
San Francisco	723,959	776,733
San Leandro	68,223	79,452
South San Francisco	54,312	60,552
Total Population	1,639,986	1,762,226

Source – (ALA-HRA-17)

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
1	Main administration building; Commander Fleet Air (COMFAIR) Alameda, comptroller; Industrial Relations Office (IRO) and regional finance center; environmental department, Disaster Preparedness Command Control Center, BRAC Office	Occupied by the City of Alameda – City Hall West, Alameda Fire Department Disaster Preparedness Office
2	Medical and dental departments (1941-1942) Chaplin, Naval Investigative Service (NIS), Bachelor Enlisted Men Quarters (BEQ), library, administrative office, telephone exchange, family services, Exchange café, reserve training; Navy Exchange, bowling alley, library; thrift shop	Light Industrial
3	Bachelor Enlisted Barracks, mess-hall and galley, general services for the BEQ (supplies and laundry)	Vacant
4	BEQ, administrative offices and club; Navy campus and Boy Scouts	Vacant
5/5A	Hangars, assembly and repair shop, metal treatment facility, including smelting, paint finishing, aircraft overhaul/repair; industrial waste pre-treatment facility, and X-ray room and tritium sign storage room. Storage locker (removed) for storing piping containing radium. Instrument shop - radium dial painting (modern equipment installed in 1948); industrial medical clinic. Radium dial paint shop closed late 1950s/early 1960s.	Vacant
Storm drain Line F (from Bldg 5/5A)	Storm drain line and associated manholes connected to Building 5/5A. Radium was found inside the piping in 1996; Piping/manholes were removed and/or cleaned in place in 1998 & 1999.	Storm Drain
Sanitary drain (from Bldg 5/5A)	Sanitary drain line from the Building 5/5A areas where radium dial painting was performed is suspected of being contaminated internally. Piping was remediated in 1998 and 1999.	Sanitary Drain

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
6	Fire station, auto vehicle maintenance; Transportation shop garage	City of Alameda Fire Department, Station 5
7 (was initially the designation of the west wing of Building 6)	Public works transportation garage and fire truck storage (during the 1940s - 1950s). After 1950s, Building 6 designation was used for entire structure.	See Building 6
7 (new building constructed south of Building 16)	Materials engineering lab, radiological materials lab and gas chromatography; used for storage of Ni-63 source in room 207 (after 1985). Ni-63 source determined missing in 1989.	Occupied
8	General warehouse, multi-purpose administration; defense information processing center, supply, financial	Warehouse
9	Aircraft storehouse; Deputy Director of Operations Command (DDOC), Naval Integrated storage, Tracking and Retrieval System (NISTARS) warehouse and storage shed; general warehouse	Commercial, Simmba Systems
10	Public Works Center (PWC) San Francisco engine lab, power plant (steam, air, electric) and heating plant	Vacant
11	Seaplane hangar; Naval Air Rework Facility (NARF) aircraft maintenance hangar and overhaul/rework shop	Vacant
12	Seaplane hangar; NARF aircraft maintenance hangar and overhaul/rework shop; contained a storage area for DU aircraft counterweights	Industrial facility
13	Air navigation office, storage for paint and oil, NAS/PWC environmental, Naval Air Reserve Activity (NARA)/Naval Air Rescue Training Unit (NARTU) training building, aircraft ground support	Warehouse for Antiques By The Bay
14	Engine test cell and standards laboratory	Light Industrial, Callahan Piano
15	Port services office and boathouse	Trident Management, Inc.
16	Dispensary; medical and dental clinic	Vacant

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
17	Bachelor Officers Quarters (BOQ) and mess, Morale, Welfare and Recreation (MWR) and supply	Vacant – to be demolished
18	Recreation office, safety office and Chaplin's office, post office, theater & religious education	Office, auction house and theatre
19	Operations building and flight control tower, photo lab, fire and rescue, meteorological building; Pacific Fleet Audio-Visual Command (PFAVC) component	Alameda Point Community Partners
20	NARTU maintenance hangar; NARA aircraft maintenance hangar;	Commercial
21	NARTU maintenance hangar; NARA aircraft maintenance hangar	Commercial, St. George Spirits
22	NARTU maintenance hangar; aircraft maintenance hangar, Fleet Maintenance Assist Group (FMAG) - 46/NARA	Commercial, Creative Technology
23	Aircraft maintenance hangar; FMAG-46, Federal Bureau of Investigation (FBI), contractors and transmitter building	Commercial
24	Paint and finishing hangar	Commercial, Coach Specialties
25	NARF/Naval Air Depot (NADEP) corrosion control facility	Commercial, Auctions by the Bay
26	Weapons storage shed; small arms and pyrotechnic magazine	Storage
27	Sewage disposal plant, sanitary wastewater facility; Public Works maintenance shop; compressor building, auto vehicle maintenance/utility plant. Sanitary sewers were connected to East Bay Municipal Utility District (EBMUD) (1956).	Vacant
28	Sewage disposal plant, welding shop, maintenance shop storage shed	Demolished
29	PWC shop, sewage pumping plant; gun test facility	Commercial, Rosenblum
30	Police station, security office, labor board, Public Works, IRO; main gatehouse; radio towers A/B	Vacant
31	Main Gate sentry house	Vacant

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
32	Enlisted locker room, Petty officer (PO) mess open, PO club; plating shop [building relocated (1955)]	Demolished
33	200,000 gallon elevated portable water tank	Demolished
34	Electrical distribution building and transformer substation	Vacant
35	Electronic communications maintenance shop; radio transmitter building	Commercial, Alameda Civic Light Opera Studio
36A	Communications antenna tower	Demolished
36B	Communications antenna tower	Demolished
37(A-1)	Gasoline storage, lubricant storage lockers and waste water storage tank	Abandoned
37(A-2)	Gasoline storage, miscellaneous liquid fuel storage tanks	Abandoned
37(A-3, 4)	Gasoline storage, contaminated fuel storage tanks	Abandoned
37(B-5)	Gasoline storage, aviation fuel storage tank	Abandoned
37(B-6)	Gasoline storage, motor vehicle ready fuel storage lockers	Abandoned
37(B-7)	Gasoline storage, aviation gas storage locker and lubricant storage	Abandoned
37(B-8)	Motor vehicle gasoline storage and lubricant storage locker	Abandoned
37(C-9)	Gasoline storage, contaminated fuel storage	Demolished
37(C-10 thru 12)	Gasoline storage, aircraft ready fuel storage lockers/tanks	Demolished
37(D-13)	Gasoline storage, aircraft ready fuel storage locker/tank	Abandoned
37(D-14, 15)	Gasoline storage, vehicle ready fuel storage lockers	Abandoned
37(D-16)	Gasoline storage, aircraft ready fuel storage locker/tank	Abandoned
37(E-17 thru 19)	Gasoline storage, aircraft ready fuel storage lockers/tanks	Abandoned
37(F-20 thru 23); (listed as 21-24 in 1988)	Jet engine fuel storage lockers/tanks	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
38(A)	Port service storage shed, United States Coast Guard Service (USCGS) tide gauge house	Occupied
38(B)	Aircraft acoustical enclosure	Demolished
39	Seaplane hangar; NARA aircraft maintenance hangar	Commercial, Delphi Productions
40	Seaplane hangar; NARA aircraft maintenance hangar	Commercial, Bladium Sports Club
41	Seaplane hangar; aircraft maintenance hangar and ground support equipment shop; Aircraft Intermediate Maintenance Department (AIMD)	Commercial, Pacific Maritime Association
42	Inert materials storehouse, fuel chemical engineering lab and office; original location of gas chromatograph, Ni-63 source; materials laboratory	Commercial caterer
43	Torpedo storehouse, weapons rework & overhaul shop; Explosive Ordnance Disposal (EOD) Group One	Unoccupied
44	Bombsight storehouse, aeronautical materials lab, NARF shop materials lab; PWC Administration, materials engineering lab; interim location for storage of x-ray equipment and DU counterweights	Occupied
45A	Fuse and detonator magazine, general storage shed – AIMD	Unknown
45B	General storage shed - AIMD	Unknown
46	Fuse and detonator magazine	Unknown
47	Fuse and detonator magazine; office and storage	Demolished
48	Fuse and detonator magazine	Unknown
49	Fuse and detonator magazine	Unknown
50	Warhead magazine, high explosive magazine	Unknown
51	Warhead magazine, small arms pyrotechnic high explosive magazine	Unknown
52	Small arms pyrotechnic high explosive magazine	Storage
53	Firing set drums magazine; inert storehouse; smoke drum storehouse	Vacant
54	Arch type magazine	Demolished
55	Arch type magazine	Demolished
56	Arch type magazine, high explosive magazine	Not in use
57	Arch type magazine, high explosive magazine	Not in use

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
58	Arch type magazine, high explosive and missile magazine	Not in use
59 (originally was the number assigned to the south end of Building 13)	Paint and oil storehouse	Warehouse for Antiques By The Bay (entire structure is now Building 13).
60	Commissioned officers mess open and officers recreation building	Recreation
61	200,00 gallon PWC water storage tank – fire	Demolished
62	Training, Public Works Department; IRO, data process center, civilian cafeteria, bank, credit union, post office	Vacant
63	Bakery; fire extinguisher maintenance shop, general services; dining hall for the BEQ	Vacant
64	Shore Intermediate Maintenance Activity (SIMA) waterfront operations building, diving locker; heating plant building for piers	Commercial, Port services
65	PWC Transformer substation for piers	In use
66	Aircraft overhaul, repair and testing; jet engine overhaul facility, engine accessory test shop; suspected work on spark gap irradiator units containing radioactive Cs-137, Co-60, Kr-85 and/or UO ₂	Light Industrial, Rigging shop
67	Locomotive and crane shed; maintenance and automotive repair shop, aircraft wash rack, self help; railroad equipment shop; ground support equipment shop	Occupied
68	Refuse incinerator, port services waterfront maintenance shop	Demolished
69	Sentry house	Demolished
70A	East gate sentry house	Demolished
71 (1940s and 1950s)	Navy Exchange gas station (west gate)	Demolished
71 (After 1980s)	Mounted A-7 aircraft (east gate)	On display
72	Lumber storage area	Demolished
73A	Bachelor officer quarters detached garage (north); general storage	Demolished
73B	Bachelor officer quarters detached garage (south) and general storage	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
74	Gasoline loading stand	Demolished
75A	Officers bath house	Demolished
75B	Cabana Officers Club	Unknown
75C	Outdoor swimming pool – officers	Demolished
76	Indoor enlisted men's swimming pool, heater room and gymnasium	Recreation
77	Radar building, air terminal, Naval Transportation Coordinating Office (NAVTRANSCO), Exchange snack stand; AIMD supply and museum	Museum
78	Barracks, multi-use building (training, etc.), family services; Industrial Relations office	Vacant
79	Barracks	Demolished
80	Barracks	Demolished
81	Barracks	Demolished
82	Wave barracks	Demolished
83	Subsistence building and storehouse; office space, mess hall and supply department storage	Demolished
84	BOQ; Chief Petty Officer (CPO) Barracks	Demolished
85	BOQ	Demolished
86	PWC sewage pump station shed	Vacant
87	Enlisted laundry and sterilizer building; special services issue equipment rental office	Demolished
88	250,000 gallon water storage tank – fire	Demolished
89	Marine Corps barracks, detached garage	Vacant
90	PO Club, supply security, employment office, recruiting office; Base conversion office - City of Alameda [building relocated (1957)]	Office
91	General warehouse; packing and shipping storage shed; Defense Logistics Agency (DLA) warehouse	Commercial
92	Packing and shipping facility; DLA general warehouse	Fusion Production Services and Red Cross
93	Chapel and Chaplin's office (before 1969)	Demolished
94	Chapel	Vacant
95	125,000 gallon PWC concrete storage tank, non-potable water	In use

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TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
96A	125,000 gallon PWC concrete ground level potable and non-potable water tank (north)	Abandoned
96B	PWC Ground level potable and non-potable water tank (south)	Abandoned
97(A)	100,000 gallon gasoline/aircraft fuel storage tank	Demolished
97(B)	100,000 gallon gasoline/aircraft fuel storage tank	Demolished
97(C)	100,000 gallon gasoline/aircraft fuel storage tank	Demolished
97(D)	100,000 gallon gasoline/aircraft fuel storage tank	Demolished
97(E)	Aircraft fuel storage tank	Demolished
98	Barrel shed, hazardous-flammable storage	Occupied
99	Scrap bins - located immediately west of the smelter unit (unnumbered)	Demolished
100	PWC electrical distribution shelter shed; transformer vault for airfield lighting	Not in use
101	Celestial navigation and synthetic training building with A-7 simulator; PWC branch office; supply department storage, apprentice school, IRO, academic instruction	Demolished (destroyed by fire)
102	Ordnance operations office building	Vacant
103	Radio wind velocity building	Demolished
104	Golf course clubhouse, nursery building and garden	Demolished
105	Storage warehouse; NAVTRANSCO storehouse	Demolished
106	Fleet Airborne Electronics Training Unit, Pacific (FAETUPAC), Fleet logistics wing support office; overseas air terminal	Demolished
107	Cafeteria	Demolished
108	Ground machine gun range	Demolished
109	Gasoline truck loading stand; aircraft fuel office	Demolished
110	Not listed	Not listed
111	Skeet range office building, pistol range	Demolished
112	Transit salvage shed; SIMA facility; NARF packaging/preservation; administration office	Commercial, Shaw
113	Salvage and reclamation shop; engine preservation operations (prior to 1948); NARF shipping container and engine repair, aircraft accessory shop and welding shop for jet engine overhaul; NADEP aircraft parts and shipping container overhaul (Possible site where engines involved in atomic testing were decontaminated)	Occupied

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
114	Public Works/maintenance shop; NARA administration office (Used as temporary storage for contaminated pipe removed from Building 5)	Vacant
115	Medical operational vehicle (ambulance) garage	Vacant – To be demolished
116	Apprentice school (prior to 1949); US Air Force procurement office; academic instruction center, rehabilitation center (drugs/alcohol)	Vacant
117	General warehouse, supply storehouse	Occupied
118	Storehouse, Navy Exchange store, general warehouse, NAVTRANSCO	Commercial facility
119 (located near Building 527)	1980s/1990s - McDonalds restaurant, <i>Source</i> restaurant	Vacant
119 (located near east gate)	1940s/1950s - Torpedo storehouse	Demolished
119 (located near taxiway 2)	Inert storehouse	Vacant, BRAC lock
120 (located near east gate)	Torpedo storehouse	Demolished
120 (located near taxiway 2)	Inert storehouse	Vacant, open
121 (located near east gate)	Torpedo storehouse	Demolished
121 (located near taxiway 2)	Inert storehouse	Vacant, BRAC lock
122 (located near east gate)	Torpedo storehouse	Demolished
122 (located near taxiway 2)	Inert storehouse; Exchange installation warehouse	Unknown
123 (located near east gate)	Inert storehouse	Demolished
124	BOQ	Demolished
125	Barracks storehouse	Demolished
126	Barracks – Supply Department storage	Demolished
127	Barracks	Demolished
128	Barracks	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
129	Barracks; Supply Department storage, Naval Air Maintenance Trainer (NAMT) classrooms, training building, administrative office, grade school	Demolished
130	Refrigerated low pressure chamber; medical lab, aviation physiology, environmental protective medicine; Navy Disease Vector Ecology and Control Center (DVECC); Thrift Shop	Vacant
131	Celestial navigation training building; IRO, Employment Development; administration	Demolished
132	Public works transportation and labor board; Fleet Aircraft Service Squadron (FASRON) 8 (moved to Bldg 132 from Bldg 23 in 1951)	Demolished
133	Radio/receiver building, Ground Electronics Maintenance Division (GEMD) facilities	Vacant
134	Drill hall; gymnasium	Recreation
135	BOQ (secured in 1972); educational equipment rental, thrift shop, Red Cross, religious education, child care center, youth center	Vacant (secured)– To be demolished
136	BOQ (secured in 1972); Commander Carrier Division (COMCARDIV) 3 Administration	Demolished
137	BOQ (secured in 1972); general warehouse, package store, recreation storage facility; BEQ (secured in 1987); Exchange maintenance shop, community/youth social center	Vacant (secured)
138	Barracks – Supply Department storage	Demolished
139	Barracks – Supply Department storage	Demolished
140	Barracks, individual family apartments; enlisted	Demolished
141	Married enlisted men's apartments	Demolished
142	Married enlisted men's apartments	Demolished
143	Married enlisted men's apartments	Demolished
144	Married enlisted men's apartments	Demolished
145	Married enlisted men's apartments	Demolished
146	Married enlisted men's apartments	Demolished
147	Married enlisted men's apartments	Demolished
148	Married enlisted men's apartments	Demolished
149	Married enlisted men's apartments	Demolished
150	Barracks	Demolished
151	Barracks; training building; dependent school and youth center	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
152	Commissary warehouse; radio station, retail warehouse	Vacant
153	Refrigerated storage warehouse	Demolished
154	Personal gear storehouse	Demolished
155	Administration building; Fleet Logistics (FLOG) Air Wing (moved to Building 155 from Building 41 - 1951)	Demolished
156	Dispensary, medical and dental annex and storage of dental equipment	Demolished
157	Ship's service and welfare storage	Demolished
158	Laundry, box factory, craft hobby shop	Demolished
159	Fire house and fire truck storage	Demolished
160	Combat training pool	Demolished
161	Not listed	Not listed
162	Ship fitting, engine accessory overhaul facility; SIMA fleet maintenance assist; base service station, base first aid station	Commercial facility
163	Public Works equipment maintenance shop; plant services for aircraft overhaul	Commercial, Sustainable Technologies
164	Torpedo attack trainer building; PWC transportation trailer	Demolished
165	Sewage pumping station	Demolished
166	Aircraft preservation building (east); NARF/NADEP shipboard aircraft support equipment; training center - Maintenance Assistance Group	Light Industrial, Delta Sandblasting Co. Inc.
167	Aircraft preservation building (west); propeller shop and aircraft preservation; FMAG; NADEP shipboard aircraft support equipment; aircraft accessory shop	Light Industrial Nelson Marine Inc.
168	Transit storage building; PWC/Fleet Industrial Supply Center (FISCA) general warehouse	Occupied. U.S. Department of Transportation
169	Transit storage building; NAS/FISCA general warehouse	Warehouse
170	Transit storage building; DLA general warehouse/storehouse; aircraft accessory overhaul and repair facility	Commercial, John's Bargain Imports

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
171	Bus station; public works transportation pool, dispatcher office and auto vehicle maintenance	Demolished
172	Lumber storage, general warehouse; FISCA equipment storage shelter	Demolished
173	PWC Water pump station and distribution building	Occupied
174A	530,000 gallon concrete PWC ground level potable water tank	In use
174B	530,000 gallon concrete PWC ground level potable water tank	In use
175	PWC electrical distribution building shelter and transformer house; gasoline storage	Vacant
176	PWC potable water pump station and distribution building	In use
177	PWC electrical distribution building shelter and transformer house (officers quarters)	In use
178	PWC electrical distribution building shelter and transformer house (CPO quarters)	In use
179	PWC water treatment facility, water pump station (Pan American well) and distribution building	Demolished
180	Gasoline booster pump station	Demolished
181	Sewage pumping station	Demolished
182	25,000 gallon concrete small craft ready fuel storage tank	Demolished
183	Personnel and security; public works department, IRO, employment office	Demolished
184	Public works storage	Demolished
185	Marine barracks kennels and storage	Demolished
186	Scrub room; motorcycle parking covered	Demolished
187	Scrub room	Demolished
188	Scrub room	Demolished
189	Scrub room	Demolished
190	Scrub room storehouse	Demolished
191	Public works maintenance shop and storage racks; general warehouse	Vacant
192	Public works time office	Demolished
193	First aid station for A/R, commissary office for Building 3; detached dining facility; administrative office	Vacant

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
194	General warehouse, maintenance storage – Aviation Resources Management Control (ARMCO)	Occupied. Alameda Fire Department
195	Paint and oil locker - ARMCO; mobile jet starter repair shop	Demolished
196	Sawdust machine; FISCA Hazardous flammable storage	Flammable storage
197	Paint and oil locker for Hangar 11; general warehouse; flight gear storage	Demolished
198	Paint and oil locker for Hangar 12	Demolished
199	Paint and oil locker for Hangar 40; hazardous flammable storage; paint and oil locker	Demolished
200	ARMCO hut for Hangar 11	Demolished
201	Rental housing, Homoja	Demolished
202	Rental housing, Homoja	Demolished
203	Rental housing, Homoja	Demolished
204	Rental housing, Homoja; line ops building	Demolished
205	Rental housing, Homoja; line ops building	Demolished
206	Rental housing, Homoja; aircraft line ops building	Demolished
207	Rental housing, Homoja; aircraft line ops building	Demolished
208	Rental housing, Homoja	Demolished
209	Rental housing, Homoja	Demolished
210	Rental housing, Homoja	Demolished
211	Rental housing, Homoja	Demolished
212	Rental housing, Homoja	Demolished
213	Rental housing, Homoja	Demolished
214	Rental housing, Homoja	Demolished
215	Rental housing, Homoja	Demolished
216	Rental housing, Homoja	Demolished
217	Rental housing, Homoja; marina club house	Demolished
218	Rental housing, Homoja	Demolished
219	Rental housing, Homoja	Demolished
220	Rental housing, Homoja	Demolished
221	Rental housing, Homoja	Demolished
222	Rental housing, Homoja; Navy Exchange garden shop; rental housing, Homoja	Demolished
223	Rental housing, Homoja	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
224	Rental housing, Homoja	Demolished
225	Rental housing, Homoja	Demolished
226	Rental housing, Homoja	Demolished
227	Rental housing, Homoja	Demolished
228	Rental housing, Homoja	Demolished
229	Rental housing, Homoja	Demolished
230	Rental housing, Homoja; weight handling equipment shop Navy Construction Battalion (SEABEES), contractor and maintenance shop	Demolished
231	Rental housing, Homoja	Not listed
232	Rental housing, Homoja	Demolished
233	Rental housing, Homoja	Demolished
234	Rental housing, Homoja	Demolished
235	Rental housing, Homoja	Demolished
236	Rental housing, Homoja	Demolished
237	Rental housing, Homoja	Demolished
238	Rental housing, Homoja	Demolished
239	Rental housing, Homoja	Demolished
240	Rental housing, Homoja; woodworking shop (SEABEES); Maintenance shop (SEABEES)	Demolished
241	Rental housing, Homoja	Demolished
242	Rental housing, Homoja	Demolished
243	Rental housing, Homoja	Demolished
244	Rental housing, Homoja	Demolished
245	Rental housing, Homoja	Demolished
246	Rental housing, Homoja	Demolished
247	Rental housing, Homoja	Demolished
248	Rental housing, Homoja	Demolished
249	Rental housing, Homoja	Demolished
250	Rental housing, Homoja	Demolished
251	Rental housing, Homoja	Demolished
252	Rental housing, Homoja	Demolished
253	Rental housing, Homoja	Demolished
254	Rental housing, Homoja	Demolished
255	Rental housing, Homoja	Demolished
256	Rental housing, Homoja; laundry, Homoja	Demolished
257	Rental housing, Homoja	Demolished
258	Rental housing, Homoja; MWR Child care center/trailer	Recreation

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
259	Rental housing, Homoja; aircraft rinse facility	Vacant
260	Rental housing, Homoja	Demolished
261	Inflammable storage; hazardous flammable storage; NARF storage	Demolished
262	Hardwood storage	Demolished
263	Welding shop; auto vehicle maintenance; self help and aircraft government specified equipment (GSE) shed	Demolished
264	Tire shop; utility building; plant nursery	Demolished
265	Hazardous flammable storage shed for A/R, O/R; plant services for aircraft overhaul - SIMA	Occupied
266(A)	Aviation gasoline office; line maintenance shelter	Demolished
266(B)	Line maintenance shelter	Demolished
266(C)	Line maintenance shelter	Demolished
267	Stevedore shelter; personnel boat house	Demolished
268	Range house	Demolished
269	Paper salvage	Unknown
270	ARMCO high explosive magazine; small arms magazine	Demolished
271	Hazardous flammable storehouse; gas cylinder storage	Commercial, Lumber Storage
272	ARMCO hut storage; liquid oxygen (LOX) and nitrogen facility - AIMD	Vacant
273	ARMCO hut storage; flammable storage; LOX and nitrogen facility; line shack; airframe shop - AIMD	Storage
274	Lath house	Demolished
275	Greenhouse building; golf house; general warehouse	Demolished
276	Hobby shop	Demolished
277	Storage shed, Special services issue office and ARMCO hut hobby shop	Demolished
278	Storage shed, ARMCO hut hobby shop	Demolished
279	ARMCO hut hobby shop; PWC pavement grounds equipment shed	Demolished
280	ARMCO hut hobby shop	Demolished
281	Inert torpedo storage; hazardous flammable storage shed	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
282	Gasoline filling station - government vehicles only	Demolished
283	ARMCO hut arresting gear storage	Demolished
284	Bus shelter (east barracks)	Bus shelter
285	CPO Club and mess open	Demolished
286	CPO Club storage	Demolished
287	PWC sewage pumping station shed	In use
288	Storehouse	Demolished
289	Storehouse	Demolished
290	Storehouse; electrical shop and storage shed – SEABEES	Demolished
291	Storehouse and storage shed (SEABEES)	Demolished
292	Docking office; port services rigger-laborer shop; storage shed	Storage shed
293	PWC boat repair shop	Demolished
294	Paint spray room for Hangar 40	Demolished
295	Bus station and shelter	Demolished
296	Bus shelter; Public Works aggregate bins	Demolished
297	CPO quarters and laundry; line shack	Demolished
298	Dispatchers office; bus shelter	Demolished
299	Public works covered storage; utility systems building and storage shed - SEABEES	Demolished
300	Public works covered storage; general warehouse; maintenance shop storage	Demolished
301	PWC maintenance and covered storage shed (1972, 1987); polychlorinated biphenyls (PCBs) leaked	Demolished
302(E)	PWC garbage can storage and can cleaning plant (1972, 1987); navigation aid target	Demolished
302(W)	PWC garbage can storage and can cleaning plant (1972, 1987); navigation aid target	Demolished
303	Direction finding building	Demolished
304	Direction finding building	Demolished
305	Machine gun test building	Demolished
306	Pistol range building	Demolished
307	Ammunition locker; inert storage shed; ready magazine	Storage shed
308	Ammunition locker; inert storage shed; ready magazine	Storage shed

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
309	Ammunition locker; maintenance aircraft spare storage shed; ready magazine (used to store DU)	Storage shed
310	Ammunition locker; maintenance aircraft spare storage shed (used to store DU and instruments with radium dials); ready magazine. Decontaminated and confirmed free of contamination in 1996	Storage shed
311	Ammunition locker; material/equipment staging and storage shed; ready magazine	Storage shed
312	Ammunition locker; aircraft maintenance spare storage shed; ready magazine	Storage shed
313	Ammunition locker; small arms/pyrotechnics storage shed; ready magazine	Storage shed
314	NARA ready service ammunition locker; small arms/pyrotechnics storage shed	Storage shed
315	NARA ready service ammunition locker; small arms/pyrotechnics storage shed	Storage shed
316	NARA ready service ammunition locker; small arms/pyrotechnics storage shed	Storage shed
317	Ammunition locker; corporate yard office and storage shed	Storage shed
318	Storage shed; Channel range light	Demolished
319	NARA ready service ammunition locker; small arms/pyrotechnics storage shed	Storage shed
320	NARA ready service ammunition locker; small arms/pyrotechnics storage shed	Storage shed
321	NARA ready service ammunition locker; hazardous flammable storage shed	Storage shed
322	Ammunition locker; ready magazine; hazardous flammable storage shed	Storage shed
323	High frequency radio direction finder	Not listed
324	Steel storage tank; general warehouse	Demolished
325	Steel storage tank; general warehouse	Demolished
326	NARA General warehouse; steel storage tank	Demolished
327	Steel storage tank; general warehouse	Demolished
328	Steel storage tank; maintenance air training facility and medical storage	Demolished
329	NARA Line maintenance shelter and storage shed	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
330	NARF/NADEP sheet metal shop, aircraft overhaul plant	Demolished
331	NARF/NADEP carpenter shop, aircraft overhaul plant	Demolished
332	Shop services garage	Unknown
333	Hobby shop garage	Demolished
334	ARMCO hut, NADEP hazardous/flammable storage - paint locker; NARA lube storage; NARF line shack	Demolished
335	ARMCO hut, FMAG-46 hazardous/flammable storage; NARA lube storage; line shack	Demolished
336	ARMCO hut, Line maintenance shelter	Demolished
337	ARMCO hut storage; SIMA hazardous/flammable storage	Not listed
338A-1	Aircraft containers; material staging facility; plant services - aircraft overhaul	Vacant
338A-2	Aircraft containers; material staging facility; plant services - aircraft overhaul	Vacant
338B-0	Aircraft containers; material staging facility; plant services - aircraft overhaul	Vacant
338B-1	Aircraft containers; material staging facility; plant services - aircraft overhaul	Vacant
338B-2	Aircraft containers; material staging facility; plant services - aircraft overhaul	Vacant
338C-1	Aircraft containers; material/equipment staging	Vacant
338C-2	Aircraft containers; material/equipment staging	Vacant
338D-3	Aircraft containers; material/equipment staging	Vacant
338D-4	Aircraft containers; material/equipment staging	Vacant
338E-3	Aircraft containers; material staging facility; plant services - aircraft overhaul	Vacant
338F-1	Aircraft containers; material/equipment staging	Vacant
338F-2	Aircraft containers; material/equipment staging	Vacant
338G-1	Aircraft containers; material/equipment staging	Vacant
338G-2	Aircraft containers; material/equipment staging	Vacant
338H-1	Aircraft containers; material/equipment staging	Vacant
338H-2	Aircraft containers; material/equipment staging	Vacant
339	Skeet range small arms pyrotechnic magazine and ammo storage shed	Demolished
340	PWC Water distribution building; fire protection pump house	Vacant

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
341	Fuel oil pumping station; aviation fuel pumping station	Unknown
342A	7,500 gallon fuel oil storage; converted to aviation fuel storage; aviation storage and tank truck/car loading facility; activity heating fuel storage	In use
342B	7,500 gallon fuel oil storage; converted to aviation fuel tank; activity heating fuel oil storage	In use
343	NARF shop stores; Aircraft overhaul plant services	Demolished
344	NARF/NADEP joiner and sheet metal shops; aircraft overhaul plant service	Demolished
345	NARF/NADEP welding shop; aircraft overhaul plant service	Demolished
346	Drop tank cleaning shop; NARF/NADEP electrical shop; materials engineering lab; reportedly used for temporary storage of radioactive waste	Vacant
347	NARF/NADEP paint and dope storage and mixing shop and finishing hangar	Storage shed
348	NARF cleaning shelter and paint finishing hangar	Demolished
349	Phenolic resin processing building; NARF/NADEP aircraft engine accessory overhaul shop	Demolished
350	Storage for CPO mess/club	Demolished
351	ARMCO hut maintenance building; paint finishing hangar; corrosion control shop	Vacant
352	ARMCO hut maintenance building; Salvage shop	Demolished
353	High explosive magazine; used for storing radioactive anomalies in 1998 and 1999	Temporary storage of radioactive anomalies
354	High explosive magazine	Unknown
355	Fuse and detonator magazine; small arms/pyrotechnic magazine	Empty bunker
356	Fuse and detonator magazine; high explosives magazine	Empty bunker

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
357	Fuse and detonator magazine; small arms/pyrotechnic magazine	Empty bunker
358	Fuse and detonator magazine	Empty bunker
359	Fuse and detonator magazine; high explosive magazine	Empty bunker
360	Aircraft engine overhaul building; engine blasting, cleaning, plating and painting shop (Prior to mid-1970s, spend grit was disposed of at Site 1 or along the NAS seawall)	Vacant
360A, B, C, D	Engine component storage buildings	Vacant
361	General warehouse; receipt/issue ready-for-issue (RFI)	Demolished
362	General warehouse	Demolished
363	Storehouse; disposal salvage scrap building	Demolished
364	Storehouse; disposal salvage scrap building	Demolished
365	Covered storage; disposal salvage scrap building - DRMO; aircraft hangar	Demolished
366	Screening lot office; disposal salvage scrap building - DRMO	Demolished
Scrap Yard	Screening lot scrap yard (11 acres of outdoor asphalt and dirt storage area) - DRMO	Vacant
367	Scrap bins; extraordinary supply disposal area - DRMO	Demolished
368	Storehouse; general warehouse in Supply Annex	Demolished
369	Storehouse; general warehouse in Supply Annex	Demolished
370	Storehouse; general warehouse in Supply Annex	Demolished
371	Storehouse; general warehouse in Supply Annex	Demolished
372	Turbo prop engine test cell	Secured
373	Aviation fuel storage structure and aviation fuel truck fueling facility	Not in use
374A	Jet engine fuel storage	Demolished
374B	Jet engine fuel storage	Demolished
375	Tank truck car unloading facility office	Unknown
376	Aviation fuel transformer house	Unknown
377	Tank truck loading facility; aviation fuel ready room	Vacant
377A	Fuel department lounge	Vacant
377B	Fuel department shop	Unknown

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
378	NARA lube storage; NARTU paint locker; general storage	Demolished
379A	Ready room office and ground control approach (GCA) unit building	Demolished
379B	Shop tool room	Demolished
380	Saluting battery gun mount	Unknown
381	Playing field/baseball bleachers	Demolished
382	Squash courts	Vacant
383	Wading pool	Demolished
384	Flagpole	Unknown
385	Boat house, Exchange snack stand; Laundromat	Port services
386	Aircraft line ops building	Demolished
387	Flagpole	Flagpole
388	Inert storehouse – ARMCO hut	Vacant, BRAC lock
389	General warehouse; station security	Unknown
390	FMAAG-46 line maintenance shelter; line shack	Demolished
391	Paint storage; general warehouse	Unknown
392	Emergency/stand-by generator building	Unknown
393	Commander Naval Air Force, Pacific (COMNAVAIRPAC) paint and blasting shop; PWC auto vehicle maintenance; refueler repair shelter	Unknown
394	Pallet repair shelter	Demolished
395	Storage building	Unknown
396	Line shack	Demolished
397	Jet engine test cell	Vacant
398	Aircraft turbine accessories overhaul, repair and testing shop	Vacant
399	Air Turbine Overhaul, repair and testing; compressor support	Vacant
400	Avionics building; aircraft maintenance hangar, overhaul, manufacture and repair; radium dial work facility - rooms 203, 204, 210 and 213 (prior to 1979). Radium, detected in the work area of rooms 203 and 204, was removed by a contractor (1999). Spark gap irradiators used Cs-137, Co-60, Kr-85 and/or UO ₂	Industrial facility

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TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
Storm/sanitary sewer lines from Building 400	Radium was found inside piping in 1996. Piping was remediated (partial) in 1998 and 1999	Storm/sanitary drains
401	Bus shelter – south gate	Demolished
402	Not listed	Not listed
403	Outdoor pistol range and flagpole; small arms range	Demolished
404	Skeet range	Demolished
405	Plant services for aircraft overhaul; aircraft ground support equipment storage.	Vacant
406	GEMD and Tactical Air Navigation (TACAN) unit building	Demolished
407	LOX and nitrogen facility	Unknown
408	Navy exchange central support; hobby shop – automotive	Demolished
409	Navy Exchange snack bar	Unknown
410	Aircraft paint cleaning/stripping/finishing shop; Industrial Waste Treatment Facility only for paint stripping waste (contractor and environmental department)	Secured
411	Electrical substation No. 4	Occupied, commercial
412	Electrical substation No. 2	Unknown
413	Electrical substation No. 3	Unknown
414	Chemical storage building; hazardous flammable storage	Occupied, commercial
415	Miscellaneous liquid storage	Demolished
416	Golf shed; CPO mess open storage	Demolished
417	Not listed	Not listed
418	Boat repair shop	Demolished
419	Officers Club barbeque	Unknown
420	Advanced Underseas Weapon (AUW) special weapons, torpedo shop	Vacant
421	Not listed	Not listed
422	Baseball field and backstop	Vacant
423	Fenced tennis courts and storage shed	Vacant
424	Playing field (softball)	Vacant
425	Playing field (softball)	Vacant
426	Not listed	Not listed

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
427	Not listed	Not listed
428	Playing field	Vacant
429	Not listed	Not listed
430	Aircraft truck fueling facility	Demolished
431	Mooring dolphin	Not in use
432	Mooring dolphin	Unknown
433	Not listed	Not listed
434	Mooring dolphin	Not in use
435	Mooring dolphin	Unknown
436	Five inch gun	Unknown
437	Ships bell	Demolished
438	Aircraft truck fueling facility	Unknown
439	Sewage pumping station	Not in use
440	Guard and watch towers; control center	Vacant
441	Guard and watch towers; sentry house	Vacant
442	Guard and watch towers; control center	Vacant
443	Fire school gear locker	Demolished
444	Not listed	Not listed
445	Not listed	Not listed
446	Not listed	Not listed
447	Boat shop; storage center	Demolished
448	Sewage pumping station	Unknown
449	Sewage pumping station	Not in use
450	National Weather Satellite Center - meteorological facility	Unknown
451	NWSC - meteorological facility	Unknown
452	NWSC - meteorological facility	Not in use
453	Incinerator	Unknown
454	Not listed	Not listed
455	Not listed	Not listed
456	Subsistence building	Unknown
457	Not listed	Not listed
458	Golf Course	Demolished
459	Exchange auto repair and service station	Gas station
460(A)	Aircraft overhaul repair shop; aircraft de-fueling facility	Unknown
461(A, B, C)	Aircraft power check facility with sound suppression – prop and jet	Demolished
462	General warehouse – fleet support	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
Building/Site Numbers	Former Uses	Current Status
463	Radar control platform - Marine Air Reserve Training Detachment (MARTD); general storage shed	Demolished
464	Van shelter; general storage shed, open	Vacant
465	Administrative office and warehouse; shop and classroom - MARTD; general storage shed	Demolished
466	Aircraft arresting gear	Unknown
467	Aircraft arresting gear	Unknown
468	Sewage pumping station	Demolished
469	Sewage pumping station	Unknown
470	Aircraft and engine overhaul, repair and testing; air vacuum pumping building	Vacant
471	Aircraft overhaul plant service; air vacuum pumping building	Demolished
472	Aircraft overhaul plant service; NADEP/NARF lumber storage	Demolished
473	Aircraft overhaul plant service; NADEP/NARF metal shear shop	Demolished
474	Aircraft overhaul plant service; welding shop	Demolished
475	Aircraft overhaul plant service; spray paint shop	Demolished
476	NARF hazardous flammable storage; NADEP paint locker	Demolished
477	NARF aircraft overhaul plant service; NADEP spray paint shop	Demolished
478	NARF aircraft overhaul plant service; NADEP saw shop	Demolished
479	NARF aircraft overhaul plant service; paint locker	Demolished
480	Storage shed; wind direction indicator; tetrahedron	Not in use
481	Not listed	Not listed
482	Not listed	Not listed
483	Aircraft arresting gear	Demolished
484	Not listed	Not listed
485	Aircraft arresting gear	Demolished
486	Not listed	Not listed
487	Not listed	Not listed
488	Field compass calibration pad	Not in use
489	Field compass calibration pad	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
490	Line maintenance shelter; ready room	Demolished
491	PWC Stand-by generator building	Occupied, commercial
492	NADEP sewage pumping station	Demolished
493	PWC sewage pumping station	In use
494	Aircraft overhaul repair and maintenance shop; office and maintenance building	Secured
495	Aircraft arresting gear	Demolished
496	GCA turntable system	Demolished
497	Weapons storage bunker - 7 cell; possible storage of special weapons	Vacant
498	Guard and watch sentry tower	Vacant
499	Electric distribution building shelter; GEMD field lighting vault	Not in use
500	Transit shed, receiving building	Unknown
501	PWC sewage pump station shed shelter; aircraft sanitary facility	In use, commercial
502	Mooring dolphin	Unknown
503	Gate sentry house	Vacant
504	Sentry house	Demolished
505	Electric substation	Unknown
506	Navy exchange hobby shop grease rack; maintenance/production storage	Demolished
507	Aircraft overhaul repair and maintenance shop shed	Demolished
508	Aircraft overhaul repair and maintenance shop shed	Demolished
509	Picnic playground	Demolished
510	Aircraft overhaul plant service; LOX facility	Demolished
511	Aircraft arresting gear	Unknown
512	Beacon – ship; dolphin	Unknown
513	Wheels up – wave off lighting shack	Not in use
514	Wheels up – wave off lighting shack	Not in use
515	Gun test facility; light gun shop; Mk 4 pod test facility	Demolished
516	Small arms/pyrotechnics magazine; special weapons magazine	Demolished
517	General store, Navy exchange service outlets	Retail

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
Building/Site Numbers	Former Uses	Current Status
518	Compass calibration support building; small arms storage; control console station	Demolished
519	Compass calibration support building; field monitor station	Demolished
520	Aircraft compass calibration pad	Demolished
521	Outdoor monument, mounted A-4 aircraft	On display
522	Civilian Employees Welfare and Recreation Association (CEWRA) office; administrative office	Administrative
523	Line crew shelter; Aircraft overhaul repair shop; covered ground check flight test	Demolished
524	PWC Public Works shop; SEABEE's office and ready room	Demolished
525	Bowling Alley – 24 lanes	Commercial, Auctions by the Bay
526	PWC Public Works shop; Line Maintenance shelter and NARA training unit maintenance shop	Demolished
527	Armed Forces Exchange Service (AFES) Credit Union	Occupied, commercial
528	Heavy equipment and auto vehicle maintenance shop (PWC/SEABEEs)	Demolished
529	Mechanics building	Vacant
530	Missile Rework Division shop – missile assembly test building	Occupied. Alameda Aerospace
531	Temporary lodging - Navy exchange motel	Unknown
532	Temporary lodging - Navy exchange motel	Demolished
533	Temporary lodging - Navy exchange motel	Unknown
534	Concrete slab (automated post office); PWC housing office	Unknown
535	Tide gauge building – Pier number 3; port services degaussing building	In use
536	Line maintenance shelter; NARA maintenance shop	Demolished
537	Line maintenance shelter; NARA maintenance shop	Demolished
538	FMAG-46 Line maintenance shelter; NARA maintenance shop	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
539	FMAG-46 Line maintenance shelter; NARA maintenance shop	Unknown
540	Maintenance shop; Aircraft spare storage	Demolished
541	NARA maintenance shop; FMAG-46 Line maintenance shelter	Unknown
542	Fleet recreation building	Vacant
543	Wells air start system	Demolished
544	LOX facility	Unknown
545	Community center; temporary child care (Play and Learn Center) for housing	Unknown
546	Bus stop	Unknown
547	Base service (express gas) station	Demolished
548	Navy Exchange mobile trailer	Demolished
549	AIMD helicopter maintenance building; line maintenance shack	Demolished
550	PWC grounds maintenance building	Occupied
551	PWC sewage holding tank and building	Vacant
552	Main electrical substation	In use
553	Electrical substation No. 6	Unknown
554	Electrical substation No. 7	In use
555	Electrical substation No. 6	In use
556	Sewer lift station pump	Unknown
557	Electrical distribution line	In use
558	Electrical substation No. 14	In use
559	Electrical substation No. 9	Unknown
560	Electrical substation No. 5	Unknown
561	Electrical substation No. 11	In use
562	Sewage pump station	In use
563	Relocated Skeet and target range with shed, fence and flag pole	Demolished
564	Consolidated liquor (package) store	Community Bible Church
565	Recreation building	Demolished
566	Guard/watch tower	Demolished
567	Arresting gear	Demolished
568	Ready service ammo locker	Demolished
569	Ready service ammo locker	Demolished
570	Ready service ammo locker	Demolished
571	Ready service ammo locker	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
572	Ready service ammo locker	Demolished
573	Ready service ammo locker	Demolished
574	Ready service ammo locker	Demolished
575	Ready service ammo locker	Demolished
576	Ready service ammo locker	Demolished
577	Ready service ammo locker	Demolished
578	Ready service ammo locker	Demolished
579	Ready service ammo locker	Demolished
580	Ready service ammo locker	Demolished
581	Ready service ammo locker	Demolished
582	NARA Line shack; detached wash rack	Demolished
583	Federal Aviation Administration (FAA) Outer marker facility	Not listed
584	Power Plant – Air/steam plant for ships	Occupied
585	CPO mess open (Top 4 Club)	Social Services
586	Sewage lift station	Not in use
587	Industrial waste pump station No. 2	Unknown
588	Industrial waste pump station No. 3	Demolished
589	Industrial waste pump station No. 4	Unknown
590	Industrial waste pump station No. 5	Unknown
591	Sewage pump station	Unknown
592	Sewage pump station	Vacant
593	Sewage lift pump	Unknown
594	Reaction Force facility	Vacant
595	Oxygen cartridge facility	Occupied
596	Aviation gasoline (AVGAS) facility; sewage lift station	Not in use
597	Sewage lift pump	Demolished
598	Avgas facility; aircraft fuel storage	Demolished
599	Arresting gear	Unknown
600	Coolant supply building	Occupied
601	Oil spill and clean-up facility	Occupied
602	Generator building	Demolished
603	Aircraft spares building	Demolished
604	Sandblasting equipment storage	Demolished
605	Generator building	Demolished
606	Aircraft rework building	Demolished
607	Craft hobby shop	Alameda Pt. Collaborative

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
608A	Auto hobby shop	Commercial
608B	Auto hobby shop	Commercial
608C	Auto hobby shop	Commercial
609	Unknown structure south end of Bldg 360	Demolished
610	Speed grinder facility	Vacant
611	GEMD Electronic repair garage	Unknown
612	PWC hose/cable storage and test facility	Commercial, Advance Roofing Service
613	Family service center	Unknown
614	Hazardous material storage	Vacant
615	Hazardous material storage	Secured
616	Hazardous material storage	Occupied; NRC Environmental Services
617	Equipment storage	Vacant
618	Pavement and grounds equipment shed	Occupied
619	Pavement and grounds equipment shed	Occupied
620	Four star maintenance building	Secured
621	Puget Sound Naval Shipyard (PSNS) Waterfront operations building	Occupied
622	Steam heating building	Unknown
623	Aviation gasoline storage	Unknown
624	GEMD shop	Occupied
625	General storage shed	Vacant
626	General storage shed	Vacant
627	Engine storage facility	Vacant
Unnumbered	Radioactive waste storage shack; former low- level radioactive material storage area, located just north of the West Beach (IR Site 2) Landfill, used to store low-level radioactive materials from late 1950's to late 1980's (no waste accepted from other activities after 1973)	Demolished – Radioactive anomalies, found just beneath the ground surface, were recovered. Restricted access area.
Unnumbered	Mini-Sea Land storage locker located near Bldg 67 was storage site for radium contaminated piping removed from Bldg 5	Storage locker was sent to off-site disposal facility.
Unnumbered	Former smelter location east of Building 66.	Demolished. Not listed.

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
IR Site 1 (78 acres)	1943-1956 Disposal Area – disposals included low-level radioactive wastes between 1943 and 1956	Inactive, restricted access area.
IR Site 2 (110 acres)	West Beach Landfill Area – disposals included low-level radioactive wastes between 1956 and 1978	Inactive, restricted access area.
IR Site 17	Seaplane Lagoon – Harbor into which seaplanes taxied in the early years of the Station. Solid samples collected in the lagoon yielded elevated levels of radium. 300 million gallons of wastewater dumped over 30 year period	Miscellaneous marine use.
Wharf 1	Quay wall between Pier 1 and Pier 2; general purpose berthing wharf	Wharf
Wharf 2	Quay wall between Pier 2 and Pier 3; general purpose berthing wharf	Wharf
Ramp 1	Boat ramp; was suspected, along with parking apron 4 to have radioluminescent paint contamination. No contamination was found during a survey of the area in 1996	Abandoned. No contamination was found during survey in 1996.
Ramp 2	Boat ramp; for seaplanes	Abandoned
Ramp 3	Boat ramp; for seaplanes	Abandoned
Ramp 4	Boat ramp; for seaplanes	Abandoned
Dock 5	Temporary dock; marina (1987)	Vacant
Pier 1	Smallest pier designed for berthing one combat stores ship, replacement oiler, or destroyer type ship; general purpose berthing (1987). Not structurally sound and not used for critical berthing purposes	Currently not structurally sound; Pier in use by Maritime Administration (MARAD)
Pier 2	Old ferry landing and moorage for Navy vessels (including nuclear ships); general purpose berthing (1987)	Pier in use by MARAD
Pier 3	Largest pier for mooring Navy vessels (including two nuclear carriers) for general purpose berthing; crushed strontium (Sr-90) deck marker resulted in portion of pier being replaced in 1996;	Pier in use by MARAD and ex-United States Ship (USS) HORNET
Pier 4	Aviation Fuel Facility (1953) – North shore of NAS; fueling pier (1987)	Vacant
Pier 5	North shore of NAS; fleet landing (1987)	Demolished

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
North Dock	Seaplane transport dock 1	Demolished
Center Dock	Seaplane transport dock 2	Demolished
South Dock	Seaplane transport dock 3	Demolished
FORMER NAS ALAMEDA HOUSING		
CPO1 through CPO30	Housing, pre-1950, enlisted	Housing for homeless
A	Housing, pre-1950, officer	Rental housing – To be rehabilitated
B	Housing, pre-1950, officer	Rental housing – To be demolished
C	Housing, pre-1950, officer	Rental housing – To be demolished
D	Housing, pre-1950, officer	Rental housing – To be demolished
E	Housing, pre-1950, officer	Rental housing – To be demolished
F	Housing, pre-1950, officer	Rental housing – To be demolished
G	Housing, pre-1950, officer	Rental housing – To be demolished
H	Housing, pre-1950, officer	Rental housing – To be demolished
I	Housing, pre-1950, officer	Rental housing – To be demolished
J	Housing, pre-1950, officer	Unknown
K	Housing, pre-1950, officer	Rental housing – To be demolished
L	Housing, pre-1950, officer	Rental housing – To be demolished
M	Housing, pre-1950, officer	Rental housing – To be demolished
N	Housing, pre-1950, officer	Rental housing – To be demolished
O	Housing, pre-1950, officer	Rental housing – To be demolished
P	Housing, pre-1950, officer	Rental housing – To be demolished
Q	Housing, pre-1950, officer	Rental housing – To be demolished
R	Housing, pre-1950, officer	Unknown

TABLE 3-3 CURRENT AND FORMER FACILITIES AT NAVAL AIR STATION ALAMEDA BY BUILDING NUMBER		
<u>Building/Site Numbers</u>	<u>Former Uses</u>	<u>Current Status</u>
S	Housing, pre-1950, officer	Rental housing – To be demolished
T	Housing, pre-1950, officer	Rental housing – To be demolished
U	Housing, pre-1950, officer	Rental housing – To be demolished
730-742	Housing, pre-1950, officer	Unknown
743-784	Housing 1950-69, officer	Unknown
785-799	Not listed	Not listed
800-837	Housing, enlisted	Unknown
838-899	Not listed	Not listed
900-999	Housing 1950-69, enlisted	Demolished
1000	Housing 1950-69, enlisted	Demolished
1001-1006	Housing 1950-69, Warrant Officer (WO)	Demolished
1007-1011	Housing 1950-69, officer	Demolished
1012 -1063	Housing 1950-69, enlisted	Vacant
1064	Sewage pumping station	Not in use
1065 - 2099	Not listed	Not listed
2100 - 2130	Picnic playgrounds	Unknown

Notes: Secured - Building is locked and windows boarded

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
Table 3-4 summarizes the uses of buildings at NAVAL AIR STATION – ALAMEDA from 1946 through post-closure. The information is taken from the reference documents indicated. Some of the references are maps of the U. S. Naval Station showing conditions on particular dates. The final structure number listed on a reference document is enclosed with a “bold” border, indicating that structures with higher numbers were constructed after the date of that reference. Many buildings were demolished during the life of the naval air station. After being identified as demolished, the following year blocks state “Not listed.” Not all buildings are listed on each of the reference documents. These are also identified as “Not listed.”							
1	Administration Building	Administration Building	Administration Building	Administration, Comptroller, COMFAIR	Administration, IRO, Finance Center	Administration, Environmental, Emergency Command Ctr. and BRAC	City of Alameda, City Hall West, Alameda Fire Department Disaster Preparedness Office
2	Enlisted Men's Barracks	Enlisted men's barracks	Enlisted men's barracks	Enlisted men's barracks. Navy Exchange, BEQ, bowling alley & library	NIS, BEQ, library, reserve training, Chaplin	NIS, BEQ, mess, Navy exchange, thrift shop, Chaplin	Light industrial
3	Mess Hall and Galley	Mess hall and galley	Mess hall and galley	Subsistence building, Enlisted men's barracks	BEQ, mess-hall, laundry	BEQ, laundry	Vacant
4	Enlisted Men's Barracks	Enlisted men's barracks	Enlisted men's barracks	Enlisted men's barracks, service club	BEQ, Enlisted club & Admin Offices	BEQ, Navy campus and Boys Scouts	Vacant

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TABLE 3-4 NAVAL AIR STATION – ALAMEDA BUILDING USE CHRONOLOGY							
Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
5/5A	Assembly and Repair Shops	Assembly and Repair shop and instrument shop; radium dial cleaning and painting (modern equipment installed in 1948)	Overhaul and Repair shop; radium dial painting shop to be modified	Aircraft overhaul and repair, offices, dispensary	Hangar; aircraft O/R, industrial waste pre-treatment, metal heat treatment, smelting, paint finishing, x-ray room	Hangar, aircraft O/R, metal finishing, metal heat treatment and metal smelting	Vacant
Storm and sanitary drains adjacent to Bldg 5/5A	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed Radium contamination was found inside the storm drain piping in 1997
6	Public Works Shops	Public Works shops	Public Works transportation shop	Fire Station, Transportation Shop, auto maintenance	Fire Station, automobile maintenance	Fire Station, PWC Transportation shop garage	City of Alameda Fire Department, Station 5
7 (located in west wing of Bldg 6)	Public Works garage and firehouse	Public Works garage and firehouse	Public Works garage and firehouse	Not listed	Not listed	Not listed	Original Building 7 was a wing of Building 6

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**TABLE 3-4
NAVAL AIR STATION - ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
7 (new building is located south of Bldg 16)	Not listed	Not listed	Not listed	Not listed; Building did not exist	Not listed; however, after 1985, material lab was used for storage of gas chromatograph with Ni-63 source (Rm 207)	Material Engineering lab; in 1989 a Ni-63 source was reported missing	Occupied
8	General Storehouse	General storehouse	General storehouse	General storehouse, supply offices, comptroller offices, data processing	Warehouse, multi-purpose administration, Defense Information Processing Ctr	Warehouse, multi-purpose administration, FISC, Defense Information Processing Ctr	Warehouse
9	Aircraft Storehouse	Aircraft storehouse	Aircraft storehouse	Aircraft storehouse	Warehouse	Warehouse, DDOC	Commercial, Simmba Systems
10	Power Plant Building	Power plant building	Power plant building	Power plant building	PWC engine lab, power plant (steam, air & electric)	PWC power plant (steam, air & electric)	Vacant
11	Seaplane Hangar	Seaplane hangar	Seaplane hangar	NARF shops, NARF offices	Hangar, aircraft maintenance and O/R	Hangar, aircraft maintenance and O/R	Vacant

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
12	Seaplane Hangar	Seaplane hangar	Seaplane hangar	NARF shops, NARF offices	Hangar, aircraft maintenance and O/R	Hangar, aircraft maintenance and O/R; contained storage area for DU counter- weights – area released in 1995	Industrial facility
13	Paint and oil storehouse	Paint and oil storehouse	Paint and oil storehouse	Paint and oil storage, NARTU, Aircraft maintenance shop	Air navigation office, storage for paint and oil, environmental, NARA/NARTU training, aircraft ground support	Storage for paint and oil, NAS/PWC environmental,	Warehouse for Antiques By The Bay
14	Motor test building	Motor test building	Motor test building	Engine test cells	Engine test cell and standards lab	Engine test cell	Light Industrial, Callahan Piano
15	Boathouse	Boathouse	Boathouse	Boathouse, EM barracks	Port services and boathouse	Port services and boathouse	Commercial, Trident Management, Inc.
16	Dispensary	Dispensary	Dispensary	Dispensary, dental clinic	Medical and dental clinic	Medical clinic	Vacant
17	BOQ	BOQ	BOQ	BOQ and mess; combined service support	BOQ and mess	BOQ and mess; MWR/NAS supply	Vacant

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**TABLE 3-4
NAVAL AIR STATION - ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
18	Recreation building	Recreation building	Recreation building	Theatre, post office, special services	Post office, theater and religious education	Post office, theater and safety office	Office, auction house and theatre
19	Operations building and control tower	Operations building and control tower	Operations building and control tower	Aircraft operations bldg, fire and crash station, photographic laboratory, fleet weather central.	Flight control tower, fire and rescue, meteorological building, Pacific Fleet Audio-Visual Facility	Flight control tower, GEMD, meteorological building, Photo laboratory (1990 -partially demolished)	Alameda Point Community Partners
20	Land plane Hangar	Land plane hangar	Land plane hangar	Maintenance hangar	Hangar, NARA aircraft maintenance	Vacant	Commercial
21	Land plane Hangar	Land plane hangar	Land plane hangar	Maintenance hangar	Hangar, NARA aircraft maintenance	Vacant	Commercial, St. George Spirits
22	Land plane Hangar	Land plane hangar	Land plane hangar	Maintenance hangar	Hangar, NARA/FMAG-46 aircraft maintenance	Hangar, FMAG-46 aircraft maintenance	Commercial, Creative Technology
23	Land plane Hangar	Land plane hangar	Land plane hangar - FASRON 8 moved from Bldg 23 to Bldg 132 in 1951	Maintenance hangar	Hangar, FMAG-46 aircraft maintenance, FBI, contractors	Hangar, FMAG-46 aircraft maintenance, FBI, contractors	Commercial

**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

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24	Not listed	Not listed	Not listed	Not listed	Not listed	Hangar; paint and finishing shop	Coach Specialties
25	Not listed	Not listed	Not listed	Not listed	Not listed	NARF/NADEP Corrosion control facility	Auction by the Bay
26	Small arms magazine	Small arms magazine	Small arms magazine	Small arms magazine	Weapons storage shed & small arms and pyrotechnic magazine	Weapons storage shed & small arms and pyrotechnic magazine	Storage
27	Sewage disposal plant	Sewage disposal plant	Sewage disposal plant	Public Works maintenance shop	Sanitary wastewater facility, auto maintenance plant & compressor bldg	Public Works maintenance shop	Vacant
28	Sewage disposal plant	Sewage disposal plant	Sewage disposal plant	Welding shop	Welding shop, maintenance storage shed	Maintenance shop (SEABEES)	Demolished
29	Sewage pumping plant	Sewage pumping plant	Sewage pumping plant	Sewage pumping plant	Sewage pump house	Gun test facility	Commercial, Rosenblum
30	Gate House and Labor Board Building	Gate house, and Labor Board Building	Gate house, police station, security office, IRO & labor board	Security office	Police station, security office, main gate house	Police station, security office	Vacant

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NAVAL AIR STATION – ALAMEDA
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31	Sentry house (Main Gate)	Sentry house (Main Gate)	Sentry house	Main gate sentry house	Main gate sentry house	Main gate sentry house	Vacant
32	Waiting Room and Boat Landing	Enlisted locker room	Enlisted locker room	1 st and 2 nd class enlisted men's club	Demolished - 1977	Not listed	Not listed
32	Not listed	Not listed	Not listed	Not listed	Not listed	Plating shop	Not listed
33	200,000 gallon water tank	200,000 gallon water tank	200,000 gallon water tank	Water tank	Elevated portable water tank	Elevated portable water tank	Demolished
34	Transformer substation	Transformer substation	Transformer substation	Transformer substation	Electrical distribution building and transformer substation	Electrical distribution building and transformer substation	Vacant
35	Radio transmitter building	Radio transmitter building	Radio transmitter building	Radio transmitter building	Electronics communication maintenance shop	Radio transmitter building	Commercial, Alameda Civic Light Opera Studio
36A	Radio tower	Radio tower	Radio tower	Radio tower	Communications antenna tower	Communications antenna tower	Demolished
36B	Radio tower	Radio tower	Radio tower	Radio tower	Communications antenna tower	Communications antenna tower	Demolished
37A-1	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Lubricant storage lockers and waste water storage tank	Waste water storage tank	Abandoned

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37A-2	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Miscellaneous liquid fuel storage tanks	Miscellaneous liquid fuel storage tanks	Abandoned
37A-3,4	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Contaminated fuel storage tanks	Contaminated fuel storage tanks	Abandoned
37B-5	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Aviation fuel storage tank	Aviation fuel storage tank	Abandoned
37B-6	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Motor vehicle ready fuel storage lockers	Motor vehicle gasoline storage	Abandoned
37B-7	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Aviation gas storage locker and lubricant storage	Lubricant storage	Abandoned
37B-8	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Motor vehicle gasoline storage and lubricant storage lockers	Motor vehicle gasoline storage	Abandoned
37C-9	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Contaminated fuel storage tank	Contaminated fuel storage tank	Demolished
37C-10, 11, 12	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Aircraft ready fuel storage lockers/tanks	Aircraft fuel storage tank	Demolished
37D-13	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Aircraft ready fuel storage lockers/tank	Aircraft fuel storage tank	Abandoned

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37D-14, 15	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Vehicle ready fuel storage lockers	Vehicle ready fuel storage lockers	Abandoned
37D-16	Gasoline storage	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Aircraft ready fuel storage lockers/tank	Aircraft fuel storage tank	Abandoned
37E-17, 18, 19	Not listed	Gasoline storage	Gasoline storage	Aircraft ready fuel storage	Aircraft ready fuel storage lockers/tanks	Aircraft fuel storage tank	Abandoned
37F-20, 21, 22, 23	Not listed	Not listed	Not listed	Aircraft ready fuel storage	Jet engine fuel storage lockers/tanks	Aircraft fuel storage tank	Demolished
38	USCGS Tide gauge house	USCGS Tide gauge house	USCGS Tide gauge house	Tide gauge house	Not listed	Port services storage shed	Not listed
38B	Not listed	Not listed	Not listed	Not listed	Not listed	Aircraft acoustical enclosure	Not listed
39	Seaplane Hangar	Seaplane hangar	Seaplane hangar	Maintenance hangar	Hangar, NARA aircraft maintenance	Hangar, aircraft maintenance	Commercial, Delphi Productions
40	Seaplane Hangar	Seaplane hangar	Seaplane hangar	Maintenance hangar	Hangar, NARA aircraft maintenance	Hangar, aircraft maintenance	Commercial, Bladium Sports Club

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41	Seaplane Hangar	Seaplane hangar	Seaplane hangar (FLOG Airwing moved from Bldg 41 to Bldg 155 in 1951)	Aircraft Maintenance	Hangar, aircraft maintenance and ground support	Hangar, aircraft maintenance	Commercial, Pacific Maritime Association
42	Inert materials storehouse	Inert materials storehouse	Inert materials storehouse	NARF shop chemical laboratory	Materials lab	Engineering lab	Commercial caterer
43	Torpedo storehouse	Torpedo storehouse	Torpedo storehouse	Torpedo and weapons shop	Ammunition rework and overhaul shop	Weapons shop	Unoccupied
44	Bombsight storehouse	Bombsight storehouse	Aeronautical materials laboratory	NARF shop materials lab	PWC administration and materials lab	PWC administration	Occupied
45A	Fuse and detonator magazine	Fuse and detonator magazine	Fuse and detonator magazine	Not listed	Not listed	General storage shed - AIMD	Unknown
45B	Not listed	Not listed	Not listed	Not listed	Not listed	General storage shed - AIMD	Unknown
46	Fuse and detonator magazine	Fuse and detonator magazine	Fuse and detonator magazine	Not listed	Not listed	Not listed	Unknown
47	Fuse and detonator magazine	Fuse and detonator magazine	Fuse and detonator magazine	Not listed	Office and storage	Not listed	Demolished

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48	Fuse and detonator magazine	Fuse and detonator magazine	Fuse and detonator magazine	Not listed	Not listed	Not listed	Unknown
49	Fuse and detonator magazine	Fuse and detonator magazine	Fuse and detonator magazine	Not listed	Not listed	Not listed	Unknown
50	Warhead magazine	Warhead magazine	Warhead magazine	High explosive magazine	High explosive magazine	High explosive magazine	Unknown
51	Warhead magazine	Warhead magazine	Warhead magazine	High explosive magazine	Small arms pyrotechnic high explosive magazine	Small arms pyrotechnic high explosive magazine	Unknown
52	Pyrotechnics magazine	Pyrotechnics magazine	Pyrotechnics magazine	Small arms and pyrotechnics magazine	Small arms pyrotechnic high explosive magazine	Small arms pyrotechnic high explosive magazine	Storage
53	Firing Set drums magazine	Firing Set drums magazine	Firing Set drums magazine	Smoke drum storehouse	Magazine inert storehouse	Magazine inert storehouse	Vacant
54	Arch type magazine	Arch type magazine	Arch type magazine	Demolished	Not listed	Not listed	Not listed
55	Arch type magazine	Arch type magazine	Arch type magazine	Demolished	Not listed	Not listed	Not listed
56	Arch type magazine	Arch type magazine	Arch type magazine	High explosive magazine	High explosive magazine	High explosive magazine	Not in use
57	Arch type magazine	Arch type magazine	Arch type magazine	High explosive magazine	High explosive magazine	High explosive magazine	Not in use

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58	Arch type magazine	Arch type magazine	Arch type magazine	High explosive and missile magazine	High explosive and missile magazine	High explosive and missile magazine	Not in use
59 (this is a separate number assigned to south end of Building 13)	Paint and oil storehouse	Paint and oil storehouse	Paint and oil storehouse	Building 59 number was eliminated; Building 13 assigned to entire building	Not listed	Not listed	Not listed
60	Officer's recreation building	Officer's recreation building	Officer's recreation building	Officers club open	Commissioned officers mess	Commissioned officers mess & Officers Club	Recreation
61	200,000 gallon water tank	200,000 gallon water tank	200,000 gallon water tank	Water storage tank – fire	PWC water storage tank – fire	PWC water storage tank – fire	Demolished
62	Cafeteria	Cafeteria	IRO and cafeteria	Civilian cafeteria, IRO offices, bank, Credit union, Post office	Navy Regional Data Automation Center (NARDAC) data processing center, civilian credit union, post office	NARDAC Data processing center	Vacant
63	Bakery	Bakery	Bakery	Bakery	BEQ mess	Fire extinguisher maintenance (fire department)	Vacant

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64	Boiler house (for piers)	Boiler house (for piers)	Boiler house (for piers)	Boiler house, steam heating plant	Boiler house, steam heating plant	SIMA waterfront operations building, diving locker	Port services
65	Transformer substation-Pier 2	Transformer substation-Pier 2	Transformer substation-Pier 2	PWC transformer substation	PWC transformer substation	PWC transformer substation	In use
66	Salvage building	Jet engine overhaul shop	Jet engine overhaul facility and engine accessory test shop	Engine accessories test shop	Aircraft O/R and testing; reported to have used spark gap irradiator units containing Cs-137, Co-60, Kr-85, and/or UO ₂	Aircraft O/R and testing	Released for unrestricted use in 1997 – Commercial, Rigging shop
67	Locomotive and crane shed	Locomotive and crane shed	Locomotive and crane shed	Locomotive and crane shed	Ground support and railroad equipment shop	Maintenance shop, automotive repair, aircraft wash rack	Occupied
68	Refuse incinerator	Refuse incinerator (secured)	Refuse incinerator (secured)	Not listed	Not listed	Port services, waterfront maintenance shop	Demolished
69	Sentry house (West gate)	West gate sentry house	West gate sentry house	Demolished	Not listed	Not listed	Not listed
70A	Sentry house (East gate)	Gate house	Gate sentry house	Gate house, East gate	East gate sentry house	East gate sentry house	Demolished
70B	Not listed	Sentry house	Sentry house	Not listed	Not listed	Not listed	Not listed

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70C	Not listed	Inspection house	Demolished	Not listed	Not listed	Not listed	Not listed
71 (1940s – 1950s)	Gasoline service station	Gasoline service station (west gate)	Navy exchange gas station (west gate)	Demolished	Not listed	Not listed	Not listed
71 (After 1980s)	Not listed	Not listed	Not listed	Not listed	Not listed	Mounted A-7 aircraft	On display
72	Lumber storage area	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
73A	BOQ garages	BOQ garage (north)	BOQ garage (north)	BOQ garage, recreation building	BOQ detached garage and general storage	Demolished - 1994	Not listed
73B	Not listed	BOQ garage (south)	BOQ garage (south)	BOQ garage	BOQ detached garage and general storage	BOQ detached garage and general storage	Demolished
74	Gasoline loading stand	Gasoline loading stand	Gasoline loading stand	Demolished	Not listed	Not listed	Not listed
75A	Officers bath house and swimming pool	Officers bath house and swimming pool	Officers bath house and swimming pool	Officers bath house	Officers bath house	Demolished – 1987	Not listed
75B	Not listed	Not listed	Not listed	Cabana Officers club	Cabana Officers club	Not listed	Unknown
75C	Not listed	Not listed	Not listed	Officers swimming pool	Officers outdoor swimming pool	Demolished - 1995	Not listed
76	Enlisted men's swimming pool and heater room	Enlisted men's swimming pool and heater room	Enlisted men's swimming pool and heater room	Enlisted swimming pool, handball courts	Enlisted indoor swimming pool and gymnasium	Enlisted indoor swimming pool and gymnasium	Recreation

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77	Radar building	Radar building	Radar building	Air terminal building, NAVTRANSCO office, snack bar	Air terminal, NAVTRANSCO Exchange snack stand	Air terminal, AIMD, supply	Air museum
78	Barracks	Barracks (secured)	Barracks (secured)	Instruction building	Multi-use building and family services	Multi-use building and family services	Vacant
79	Barracks	Barracks (secured)	Barracks (secured)	Demolished	Not listed	Not listed	Not listed
80	Barracks	Barracks (secured)	Barracks (secured)	Demolished	Not listed	Not listed	Not listed
81	Barracks	Barracks (secured)	Barracks (secured)	Demolished	Not listed	Not listed	Not listed
82	Barracks	Barracks	Wave barracks	Demolished	Not listed	Not listed	Not listed
83	Subsistence building	Subsistence building, storehouse	Subsistence building and storehouse	Demolished	Not listed	Not listed	Not listed
84	Bachelor Officers Quarters	BOQ (secured)	BOQ (secured)	CPO barracks	Demolished - 1975	Not listed	Not listed
85	Bachelor Officers Quarters	BOQ (secured)	BOQ (secured)	Demolished	Not listed	Not listed	Not listed
86	Sewage pumping plant	Sewage pumping plant	Sewage pumping plant	Sewage pumping plant	PWC sewer pumping station	PWC sewer pumping station	Vacant
87	Enlisted men's laundry and sterilization bldg	Enlisted men's laundry and sterilization bldg	Enlisted men's laundry and sterilization bldg	Special services issue equipment rental office	Special services issue equipment rental office	Demolished - 1989	Not listed

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88	250,000 gallon water tank	250,000 gallon water tank	250,000 gallon water tank	PWC water storage tank-fire	PWC water storage tank-fire	PWC water storage tank-fire	Demolished
89	Marine barracks garage	Marine barracks garage	Marine barracks garage	Marine Corps barracks detached garage	Marine Corps barracks detached garage	Marine Corps barracks detached garage	Vacant
90	Waves recreation	PO Club	Supply security section	Employment office, recruiting office	Employment office, recruiting office	Recruit processing, Alameda Base conversion	Office
91	Packing and shipping storehouse	Packing and shipping storehouse	Packing and shipping storehouse	Packing and shipping storehouse	General warehouse, shipping and storage shed	DLA warehouse, shipping and storage shed	Commercial
92	General storehouse	General storehouse	General storehouse	Packing and shipping storehouse	General warehouse, shipping and storage shed	DLA warehouse, shipping and storage shed	Commercial, Fusion Production Services, Red Cross
93	Additional office building	Additional office building	Chaplin's office	Demolished	Not listed	Not listed	Not listed
94	Chapel	Chapel	Chapel	Chapel	Chapel	Chapel	Vacant
95	125,000 gallon concrete water tank	125,000 gallon concrete water tank	125,000 gallon concrete water tank	PWC storage non-potable water	PWC storage non-potable water	PWC storage non-potable water	In use
96A	125,000 gallon concrete water tank	125,000 gallon concrete water tank (north)	125,000 gallon concrete water tank (north)	PWC storage potable water	PWC storage non-potable water	PWC storage non-potable water	Abandoned

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96B	125,000 gallon concrete water tank	125,000 gallon concrete water tank (south)	125,000 gallon concrete water tank (south)	PWC storage potable water	PWC storage non-potable water	PWC storage non-potable water	Abandoned
97A	100,000 gallon gasoline storage tank	100,000 gallon gasoline storage tank	100,000 gallon gasoline storage tank	AVGAS storage tank	Aircraft fuel storage tank	Demolished - 1988	Not listed
97B	100,000 gallon gasoline storage tank	100,000 gallon gasoline storage tank	100,000 gallon gasoline storage tank	AVGAS storage tank	Aircraft fuel storage tank	Demolished - 1988	Not listed
97C	100,000 gallon gasoline storage tank	100,000 gallon gasoline storage tank	100,000 gallon gasoline storage tank	AVGAS storage tank	Aircraft fuel storage tank	Demolished - 1988	Not listed
97D	100,000 gallon gasoline storage tank	100,000 gallon gasoline storage tank	100,000 gallon gasoline storage tank	AVGAS storage tank	Aircraft fuel storage tank	Demolished - 1988	Not listed
97E	Not listed	Not listed	Not listed	AVGAS storage tank	Aircraft fuel storage tank	Demolished - 1988	Not listed
98	Barrel shed	Barrel shed	Barrel shed	Barrel shed	Hazardous flammable storage	Hazardous flammable storage	Occupied
99	Scrap bins	Scrap bins	Scrap bins	Demolished	Not listed	Not listed	Not listed
100	Transformer vault	Transformer vault; airfield lighting	Transformer vault; airfield lighting	Transformer vault; airfield lighting	PWC electrical distribution shelter shed	NAS transformer vault	Not in use

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101	Celestial navigation and synthetic training building	Celestial navigation and synthetic training building	Celestial navigation and synthetic training building	Training building	Academic Instruction	Academic Instruction	Demolished
102	Ordnance office building	Ordnance office building	Ordnance office building	Ordnance office building	Ordnance operations office	Ordnance operations office	Vacant
103	Radio wind velocity building	Radio wind velocity building	Demolished 1950	Not listed	Not listed	Not listed	Not listed
104	Nursery building and gardens	Nursery building and gardens	Nursery building and gardens	Golf course club house	Golf course club house , nursery	Not listed	Not listed
105	Storehouse	Storehouse	Storehouse	NAVTRANSCO storehouse	Demolished - 1975	Not listed	Not listed
106	FAETU PAC. school	Fleet logistics wing support	Overseas air terminal	Demolished	Not listed	Not listed	Not listed
107	Cafeteria	Cafeteria	Cafeteria	Not listed	Not listed	Not listed	Not listed
108	Ground machine gun range	Ground machine gun range	Ground machine gun range	Not listed	Not listed	Not listed	Not listed
109	Gasoline truck loading stand	Gasoline truck loading stand	Gasoline truck loading stand	Aircraft fuel office	Aircraft fuel office	Not listed	Not listed
110	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
111	Skeet Range office building	Skeet Range office building	Skeet Range office building	Skeet and pistol range building	Skeet range office building, pistol range	Demolished – 1994	Not listed
112	Transit salvage shed	Transit salvage shed	Transit salvage shed	NARF packaging and preservation	Administration office	SIMA Facility	Commercial, Shaw

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113	Salvage and reclamation shop	Salvage and reclamation shop	Jet engine overhaul shop; NARF shipping container and engine accessory O/R shop and welding shop	NARF shipping container and engine accessory O/R shop and welding shop for jet engine overhaul	NARF shipping container and engine repair, accessory shop and welding shop for jet engine overhaul	NADEP aircraft parts and shipping container overhaul	Occupied
114	Public Works office and maintenance shop	Public Works office and maintenance shop	Public Works office and maintenance shop	Public Works office, maintenance shops	Public Works maintenance shop, NARA admin office	Public Works maintenance shop	Temporary storage area for contaminated pipe removed from Building 5 in May 1995 – Currently Vacant
115	Ambulance garage	Ambulance garage	Ambulance garage	Ambulance garage	Medical operational vehicle (ambulance) garage	Medical operational vehicle (ambulance) garage	Vacant
116	Corpsmen's Barracks	Training building	US Air Force procurement office	Training building	Academic instruction center	Rehabilitation center (drugs & alcohol)	Vacant
117	Storehouse	Storehouse	Storehouse	Storehouse	General warehouse, supply storehouse	General warehouse, supply storehouse	Occupied

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NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
118	Storehouse	Storehouse	Storehouse	Navy exchange store, warehouse, NAVTRANSCO	Navy exchange store, warehouse, NAVTRANSCO	Navy exchange store, warehouse	Commercial facility
119 (1940s – 1950s near Building 118)	Torpedo storehouse	Torpedo storehouse	Torpedo storehouse	Demolished	Not listed	Not listed	Not listed
119 (near Bldg 527)	Not listed	Not listed	Not listed	Not listed	Not listed	McDonalds	Vacant
119 (near airfield)	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Vacant, BRAC lock
120 (1940s – 1950s near Building 118)	Torpedo storehouse	Torpedo storehouse	Torpedo storehouse	Demolished	Not listed	Not listed	Not listed
120 (After 1970 near airfield)	Not listed	Not listed	Not listed	Storehouse	Inert storehouse	Inert storehouse	Vacant
121 (1940s – 1950s near Building 118)	Torpedo storehouse	Torpedo storehouse	Torpedo storehouse	Demolished	Not listed	Not listed	Not listed
121 (After 1970 near airfield)	Not listed	Not listed	Not listed	Storehouse	Inert storehouse	Inert storehouse	Vacant, BRAC lock
122 (1940s – 1950s near Building 118)	Torpedo storehouse	Torpedo storehouse	Torpedo storehouse	Demolished	Not listed	Not listed	Not listed

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
122 (After 1970 near airfield)	Not listed	Not listed	Not listed	Storehouse	Exchange installation warehouse	Inert storehouse	Unknown
123	Inert storehouse	Inert storehouse	Inert storehouse	Demolished	Not listed	Not listed	Not listed
124	Bachelor Officers Quarters	BOQ (secured)	Demolished 1958	Not listed	Not listed	Not listed	Not listed
125	Barracks	Barracks storehouse	Barracks storehouse	Demolished	Not listed	Not listed	Not listed
126	Barracks	Barracks storehouse	Barracks; Supply Dept storage	Demolished	Not listed	Not listed	Not listed
127	Barracks	Barracks (secured)	Barracks (secured)	Demolished	Not listed	Not listed	Not listed
128	Barracks	Barracks (secured)	Barracks (secured)	Demolished	Not listed	Not listed	Not listed
129	Barracks	Barracks storehouse	Barracks; Supply Dept storage, NAMT classroom	Training building	Demolished - 1997	Not listed	Not listed
130	Refrigerated low pressure chamber	Refrigerated low pressure chamber	Refrigerated low pressure chamber	Medical, Disease vector control office	Medical lab, environmental protection medicine, DVECC and Thrift shop	Medical lab, environmental protection medicine, DVECC	Vacant

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

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131	Celestial navigation trainer building	Celestial navigation trainer building	Celestial navigation trainer building	Administration	Demolished	Not listed	Not listed
132	Fleet Air and training building	Public Works transportation and labor board	Fleet Air training bldg; FASRON 8 (re-located from Bldg 23 in 1951)	Demolished	Not listed	Not listed	Not listed
133	Radio building	Radio building	Radio building	Receiver building	Radio/receiver building GEMD	Radio/receiver building GEMD	Vacant
134	Drill hall	Drill hall	Drill hall	Gymnasium	Gymnasium	Gymnasium	Recreation
135	Bachelor Officer's Quarters	BOQ (secured)	BOQ (secured)	BOQ (secured), Thrift shop, Red Cross, child care center, youth center, religious education	Red Cross, child care center, youth center, religious education	Educational equipment rental	Vacant (secured)
136	Bachelor Officer's Quarters	BOQ (secured)	BOQ (secured)	BOQ (secured), COMCARDIV 3 administration	Demolished in 1973	Not listed	Not listed
137	Bachelor officer's mess storehouse	Bachelor officer's mess storehouse	Bachelor officer's mess storehouse	Recreation teen center	BEQ (secured in 1987), Exchange maintenance shop, youth social center	MWR/FISC warehouse, youth social center	Vacant (secured)
138	Barracks-3 unit B1-B type	Barracks, storage	Barracks, storage	Demolished	Not listed	Not listed	Not listed

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
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139	Barracks-3 unit B1-B type	Barracks, storage	Barracks, storage	Demolished	Not listed	Not listed	Not listed
140	Barracks-3 unit B1-B type	Barracks, storage	Barracks, storage	Demolished	Not listed	Not listed	Not listed
141	Barracks-3 unit B1-B type	Married enlisted apartment	Married enlisted apartment	Demolished	Not listed	Not listed	Not listed
142	Barracks-3 unit B1-B type	Married enlisted apartment	Married enlisted apartment	Demolished	Not listed	Not listed	Not listed
143	Barracks-3 unit B1-B type	Married enlisted apartment	Married enlisted apartment	Demolished	Not listed	Not listed	Not listed
144	Barracks-3 unit B1-B type	Married enlisted apartment	Married enlisted apartment	Demolished	Not listed	Not listed	Not listed
145	Barracks-3 unit B1-B type	Married enlisted apartment	Married enlisted apartment	Demolished	Not listed	Not listed	Not listed
146	Barracks-2 unit B1-B type	Married enlisted apartment	Married enlisted apartment	Demolished	Not listed	Not listed	Not listed
147	Barracks-2 unit B1-B type	Married enlisted apartment	Married enlisted apartment	Demolished	Not listed	Not listed	Not listed
148	Barracks-1 unit B1-B type	Married enlisted apartment	Married enlisted apartment	Demolished	Not listed	Not listed	Not listed
149	Barracks-1 unit B1-B type	Married enlisted apartment	Married enlisted apartment	Demolished	Not listed	Not listed	Not listed
150	Barracks-1 unit B1-B type	Barracks-1 unit B1-B type (secured)	Barracks (secured)	Demolished	Not listed	Not listed	Not listed

TABLE 3-4
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151	Barracks-1 unit B1-B type	Barracks-1 unit B1-B type (secured)	Barracks (secured)	Training building	Dependents school and youth center	Demolished - 1992	Not listed
152	Subsistence building and barracks	Commissary store and storehouse	Commissary store and storehouse	Commissary warehouse, retail warehouse, radio station	Commissary warehouse	Commissary warehouse	Vacant
153	Refrigerated storehouse	Refrigerated storehouse	Refrigerated storehouse	Refrigerated storage warehouse	Refrigerated storage warehouse	Refrigerated storage warehouse	Demolished
154	Personnel storehouse	Personnel storehouse	Personal gear storehouse	Demolished	Not listed	Not listed	Not listed
155	Administration building	Administration building (secured)	Administration building (FLOG Airwing moved to Bldg 155 from Bldg 41 in 1951)	Demolished	Not listed	Not listed	Not listed
156	Dispensary	Dispensary	Dispensary (secured); storage for dental equipment (1950-1957)	Not listed	Not listed	Not listed	Demolished
157	Ships service and welfare building	Ships service and welfare building storehouse	Ships service and welfare storage	Not listed	Not listed	Not listed	Demolished
158	Laundry	Laundry	Laundry and box factory	Craft hobby shop	Craft hobby shop	Demolished - 1982	Not listed

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
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159	Firehouse	Fire house	Fire house	Demolished	Not listed	Not listed	Not listed
160	Combat training pool	Combat training pool	Combat training pool (secured)	Not listed	Not listed	Not listed	Demolished
161	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
162	Engine overhaul building	Engine overhaul building	Engine overhaul building and base first aid station	SIMA Fleet maintenance assist, ship fitting, engine accessory facility	SIMA Fleet maintenance assist, ship fitting, engine accessory facility	SIMA Fleet maintenance assist, ship fitting, engine accessory facility	Commercial facility
163	Storehouse	Public Works equipment and maintenance shop	Public Works equipment and maintenance shop	Plant services, equipment maintenance and aircraft overhaul	Plant services, equipment maintenance and aircraft overhaul	Plant services, equipment maintenance and aircraft overhaul	Commercial, Sustainable Technologies
164	Crail torpedo attack trainer building	Crail torpedo attack trainer building	Torpedo attack trainer building	Not listed	Not listed	PWC transportation trailer	Demolished
165	Sewage pumping station (East barracks)	Sewage pumping station (East barracks)	Sewage pumping station	Not listed	Not listed	Not listed	Demolished
166	Aircraft preservation building (East)	Aircraft preservation building (east)	Aircraft preservation building (east)	NARF shipboard aircraft support equipment	Training Center, FMAG	NADEP shipboard aircraft support equipment	Light Industrial, Delta Sandblasting Inc.

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167	Aircraft preservation building (West)	Aircraft preservation building (west)	Aircraft preservation building (west)	Propeller shop and aircraft preservation, FMAG	Aircraft accessory shop	NADEP shipboard aircraft support equipment	Light Industrial, Nelson's Marine, Inc.
168	Transit storage building	Transit storage building	Transit storage building	Storehouse	PWC/FISCA warehouse	NAS/FISCA warehouse	Occupied. U.S. Department of Transportation
169	Transit storage building	Transit storage building	Transit storage building	Storehouse	FISCA warehouse	FISCA warehouse	Warehouse
170	Transit storage building	Transit storage building	Transit storage building	Storehouse	Aircraft accessory O/R	DLA warehouse	Commercial, John's Bargain Imports
171	Bus station	Bus station	Bus station and Public Works transportation pool	Public Works transportation	Dispatcher office and automobile vehicle maintenance	Demolished - 1989	Not listed
172	Lumber storage	Lumber storage	Lumber storage	Storage, equipment storage shelter	General warehouse, equipment storage shelter	FISCA equipment storage shelter	Demolished
173	Water pumping station	Water pumping station	Water pumping station	Water pumping station	PWC water pump station and distribution bldg	PWC water pump station and distribution bldg	In use
174A	Not listed	530,000 gallon concrete water tank	530,000 gallon concrete water tank	Water storage tank	PWC ground level potable water tank	PWC ground level potable water tank	In use

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
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174B	Not listed	530,000 gallon concrete water tank	530,000 gallon concrete water tank	Water storage tank	PWC ground level potable water tank	PWC ground level potable water tank	In use
175	Not listed	Transformer house (gasoline storage)	Transformer house (gasoline storage)	Transformer house	PWC electrical distribution shelter and transformer house	PWC electrical distribution shelter and transformer house	Vacant
176	Not listed	Water pumping station (Army well)	Water pumping station (Army well)	Water pumping station	PWC potable water pump station – Secured	PWC potable water pump station	In use
177	Not listed	Transformer house (officer's quarters)	Transformer house (officer's quarters)	Transformer house	PWC electrical distribution shelter and transformer house	PWC electrical distribution shelter and transformer house	In use
178	Not listed	Transformer house (CPO quarters)	Transformer house (CPO quarters)	Transformer house	PWC electrical distribution shelter and transformer house	PWC electrical distribution shelter and transformer house	In use
179	Not listed	Water pumping station (Pan American well)	Water pumping station (Pan American well)	Water pumping station	PWC water treatment facility, water pump station and distribution bldg	PWC water pump station and distribution bldg	Demolished

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**TABLE 3-4
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180	Not listed	Gasoline booster pump station	Gasoline booster pump station	Gasoline booster pump station	Gasoline booster pump station	Gasoline booster pump station	Demolished
181	Not listed	Sewage pumping station	Sewage pumping station	Demolished	Not listed	Not listed	Not listed
182	Not listed	25,000 gallon concrete fuel storage tank	25,000 gallon concrete fuel storage tank	Marine ready fuel	Small craft ready fuel storage	Demolished - 1986	Not listed
183	Not listed	Personnel and security offices;	Employment office and IRO - Demolished in 1950	Not listed	Not listed	Not listed	Not listed
184	Not listed	Public Works storage	Public Works storage	Demolished	Not listed	Not listed	Not listed
185	Not listed	Kennels	Marine storage	Demolished	Not listed	Not listed	Not listed
186	Not listed	Scrub room	Scrub room	Scrub room	Scrub room	Motorcycle parking - covered	Demolished
187	Not listed	Scrub room	Scrub room	Scrub room	Scrub room	Demolished	Not listed
188	Not listed	Scrub room	Scrub room	Demolished	Not listed	Not listed	Not listed
189	Not listed	Scrub room	Scrub room	Demolished	Not listed	Not listed	Not listed
190	Not listed	Scrub room (storehouse)	Scrub room (storehouse)	Demolished	Not listed	Not listed	Not listed
191	Not listed	Public Works storage rack	Public Works storage rack	Storage racks, maintenance shop	Public Works maintenance shop, storage racks and warehouse	Public Works maintenance shop and storage racks	Vacant

TABLE 3-4
NAVAL AIR STATION – ALAMEDA
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192	Not listed	Public Work time office	Public Work time office	Not listed	Not listed	Not listed	Not listed
193	Not listed	First aid station for A/R	Commissary office	Commissary office	Detached dining facility	Administrative offices	Vacant
194	Not listed	Public Works storage (ARMCO)	Public Works storage (ARMCO)	ARMCO maintenance storage	General warehouse	ARMCO maintenance storage	Occupied. Alameda Fire Department
195	Not listed	Paint and oil locker (ARMCO)	Paint and oil locker (ARMCO)	Mobile jet starter repair shop	Not listed	Not listed	Demolished
196	Not listed	Sawdust machine	Sawdust machine	Flammable storage	FISCA hazardous flammable storage	FISCA hazardous flammable storage	Flammable storage
197	Not listed	Paint and oil locker-hangar 11	Paint and oil locker-hangar 11	Flight gear storage	General warehouse	Demolished	Not listed
198	Not listed	Paint and oil locker-hangar 12	Paint and oil locker-hangar 12	Not listed	Not listed	Not listed	Not listed
199	Not listed	Paint and oil locker-hangar 40	Paint and oil locker-hangar 40	Paint and oil locker	Hazardous flammable storage	Demolished - 1990	Not listed
200	Not listed	ARMCO hut, hangar 11	ARMCO hut, hangar 11	Demolished		Not listed	Not listed
201	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
202	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
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203	Not listed	Rental housing, Homoja	Rental housing, Homoja	Line shack	Not listed	Not listed	Not listed
204	Not listed	Rental housing, Homoja	Rental housing, Homoja	Not listed	Line ops building	Demolished	Not listed
205	Not listed	Rental housing, Homoja	Rental housing, Homoja	Line shack	Demolished	Not listed	Not listed
206	Not listed	Rental housing, Homoja	Rental housing, Homoja	Line shack	Aircraft line ops building	Demolished – 1984	Not listed
207	Not listed	Rental housing, Homoja	Rental housing, Homoja	Line shack	Aircraft line ops building	Demolished - 1984	Not listed
208	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
209	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
210	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
211	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
212	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
213	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
214	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
215	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed

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NAVAL AIR STATION – ALAMEDA
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216	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
217	Not listed	Rental housing, Homoja	Rental housing, Homoja	Marina club house	Marina club house	Demolished - 1996	Not listed
218	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
219	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
220	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
221	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Not listed	Demolished - 1996	Not listed
222	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Not listed	Navy exchange, garden shop	Demolished
223	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
224	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
225	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
226	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
227	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
228	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed

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229	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
230	Not listed	Rental housing, Homoja	Rental housing, Homoja	Maintenance shop	Weight handling equipment shop (SEABEEs)	Weight handling equipment shop (SEABEEs)	Demolished
231	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Not listed	PWC building	Not listed
232	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
233	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
234	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
235	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
236	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
237	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
238	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
239	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
240	Not listed	Rental housing, Homoja	Rental housing, Homoja	Maintenance shop (SEABEEs)	Maintenance shop (SEABEEs)	Woodworking shop (SEABEEs)	Demolished

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241	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
242	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
243	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
244	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished – 1977	Not listed	Not listed
245	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished – 1977	Not listed	Not listed
246	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished - 1977	Not listed	Not listed
247	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
248	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
249	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
250	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
251	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
252	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished - 1976	Not listed	Not listed
253	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
254	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
255	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed
256	Not listed	Rental housing, Homoja	Rental housing, Homoja	Laundry, Homoja	Demolished – 1977	Not listed	Not listed
257	Not listed	Rental housing, Homoja	Rental housing, Homoja	Rental housing, Homoja	Demolished - 1976	Not listed	Not listed
258	Not listed	Rental housing, Homoja	Rental housing, Homoja	Not listed	Not listed	MWR child care center trailer	Recreation
259	Not listed	Rental housing, Homoja	Rental housing, Homoja	Not listed	Not listed	Aircraft rinse facility - Vacant	Vacant
260	Not listed	Rental housing, Homoja	Rental housing, Homoja	Demolished	Not listed	Not listed	Not listed
261	Not listed	Inflammable storage	Inflammable storage	NARF storage	NARF Hazardous flammable storage	NADEP storage	Demolished
262	Not listed	Hardwood storage	Hardwood storage	Not listed	Not listed	Not listed	Demolished
263	Not listed	Welding shop	Welding shop	Welding shop	Auto vehicle maintenance	Self help and GSE shed	Demolished
264	Not listed	Tire shop	Tire shop	Utility building	Plant nursery	Demolished - 1994	Not listed

**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
265	Not listed	Hazardous materials A/R	Hazardous materials O/R	Hazardous flammable storage shed	Hazardous flammable storage shed	Plant services for aircraft overhaul	Occupied
266A	Not listed	Aviation gasoline office	Aviation gasoline office	Line shack	Line maintenance shelter	Line maintenance shelter – Vacant	Demolished
266B	Not listed	Not listed	Not listed	Not listed	Not listed	Line maintenance shelter – Vacant	Demolished
266C	Not listed	Not listed	Not listed	Not listed	Not listed	Line maintenance shelter - Vacant	Demolished
267	Not listed	Stevedore shelter	Stevedore shelter	Personnel boat house	Not listed	Not listed	Demolished
268	Not listed	Range house	Range house	Demolished	Not listed	Not listed	Not listed
269	Not listed	Paper salvage	Paper salvage	Not listed	Not listed	Not listed	Unknown
270	Not listed	ARMCO high explosive magazine	ARMCO high explosive magazine	High explosive magazine, small arms	High explosive magazine, small arms	Demolished – 1987	Not listed
271	Not listed	Gas cylinder storage	Gas cylinder storage	Gas cylinder storage	Hazardous flammable store house	Gas cylinder storage	Commercial, Lumber storage
272	Not listed	ARMCO hut storage	ARMCO hut storage	LOX and nitrogen facility (AIMD)	LOX and nitrogen facility (AIMD)	LOX and nitrogen facility (AIMD)	Vacant

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
273	Not listed	ARMCO hut storage	ARMCO hut storage	Line shack	Flammable storage; LOX and nitrogen	Airframe shop (AIMD)	Storage
274	Not listed	Lath house	Lath house	Demolished	Not listed	Not listed	Not listed
275	Not listed	Green house	Green house	Storage	Golf house	Golf house	Demolished
276	Not listed	Hobby shop	Hobby shop	Demolished	Not listed	Not listed	Not listed
277	Not listed	ARMCO hut hobby shop	ARMCO hut hobby shop	Storage shed, special services issue office and ARMCO hut	Storage shed, special services issue office and ARMCO hut	Demolished - 1994	Not listed
278	Not listed	ARMCO hut hobby shop	ARMCO hut hobby shop	Storage shed, ARMCO hut	Storage shed, ARMCO hut	Demolished - 1994	Not listed
279	Not listed	ARMCO hut hobby shop	ARMCO hut hobby shop	Not listed	PWC pavement grounds equipment shed	Demolished	Not listed
280	Not listed	ARMCO hut hobby shop	ARMCO hut hobby shop	Demolished	Not listed	Not listed	Not listed
281	Not listed	Inert torpedo storage	Inert torpedo storage	Storage	Hazardous flammable storage shed, Demolished mid- 1980s	Not listed	Demolished pre- 1987

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
282	Not listed	Gasoline service station	Gasoline service station	Gasoline service station	Filling station – Government vehicles only	Filling station – Government vehicles only, Demolished late-1990s	Not listed
283	Not listed	ARMCO hut storage	ARMCO hut storage	ARMCO hut, arresting gear storage	ARMCO hut, arresting gear storage	ARMCO hut, arresting gear storage -Vacant	Demolished
284	Not listed	Bus shelter	Bus shelter	Bus shelter	Not listed	Not listed	Bus Shelter
285	Not listed	CPO Club	CPO Club	CPO mess open	CPO mess open	Not listed	Demolished
286	Not listed	CPO Club storage	CPO Club storage	Demolished	Not listed	Not listed	Not listed
287	Not listed	Sewage pumping plant	Sewage pumping plant	PWC sewage pumping station shed	PWC sewage pumping station shed	PWC sewage pumping station shed	In use
288	Not listed	Storehouse	Demolished 1951	Not listed	Not listed	Not listed	Not listed
289	Not listed	Storehouse	Demolished 1950	Not listed	Not listed	Not listed	Not listed
290	Not listed	Storehouse	Storehouse	Storehouse	Electric shop and storage shed (SEABEEs)	Electric shop and storage shed (SEABEEs)	Demolished
291	Not listed	Storehouse	Storehouse	Storehouse	Storage shed (SEABEEs)	Storage shed (SEABEEs)	Demolished
292	Not listed	Docking office	Public Works riggers	Public Works riggers	Port services, riggers and laborers shop and storage shed	Port services, riggers and laborers shop and storage shed	Storage shed

**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
293	Not listed	Boat repair shop	Boat repair shop	PWC boat repair shop	PWC boat repair shop	Demolished - 1988	Not listed
294	Not listed	Paint spray room, hangar 40	Paint spray room, hangar 40	Demolished	Not listed	Not listed	Not listed
295	Not listed	Bus station	Bus station	Bus shelter	Bus shelter	Demolished – 1989	Not listed
296	Not listed	Public Works aggregate bins	Public Works aggregate bins	Public Works aggregate bins	Demolished - 1983	Not listed	Not listed
297	Not listed	CPO quarters laundry	CPO quarters laundry	Line shack	Not listed	Not listed	Demolished
298	Not listed	Bus shelter and dispatcher's office	Bus shelter	Bus shelter	Demolished - 1989	Not listed	Not listed
299	Not listed	Public Works covered storage	Public Works covered storage	Covered storage	Utility systems building and storage (SEABEEs)	Utility systems building and storage (SEABEEs)	Demolished
300	Not listed	Public Works covered storage	Public Works covered storage	Maintenance shop storage	Maintenance shop storage	General warehouse (SEABEEs)	Demolished
301	Not listed	Public Works storage	Public Works covered storage	PWC maintenance storage	PWC maintenance storage	PWC maintenance storage	Demolished

**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

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302	Not listed	Public Works garbage can cleaning plant	Public Works garbage can cleaning plant	Garbage can cleaning	PWC garbage can storage and can cleaning plant	Navigation aid target	Demolished
302W	Not listed	Not listed	Not listed	Not listed	PWC garbage can storage and can cleaning plant	Navigation aid target	Demolished
303	Not listed	Direction finding building	Demolished 1950	Not listed	Not listed	Not listed	Not listed
304	Not listed	Direction finding building	Demolished 1950	Not listed	Not listed	Not listed	Not listed
305	Not listed	Machine gun test building	Machine gun test building	Demolished	Not listed	Not listed	Not listed
306	Not listed	Pistol range building	Pistol range building	Demolished	Not listed	Not listed	Not listed
307	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	Inert storage shed, ready magazine	Inert storage shed, ready magazine – Vacant	Storage shed
308	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	Inert storage shed, ready magazine	Inert storage shed, ready magazine	Storage shed

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
309	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	Ready magazine	Maintenance aircraft spare storage shed (used to store DU)	Storage shed
310	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	Ready magazine	Maintenance aircraft spare storage shed (used to store DU and instruments with radium dials)	Decontaminated and surveyed in 1996 and determined free of contamination; storage
311	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	Ready magazine	Aircraft maintenance spare storage	Storage shed
312	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	Ready magazine	Small arms pyrotechnic storage shed	Storage shed
313	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	NARA ready service ammunition locker	Small arms/pyrotechnic storage shed – Vacant	Storage shed
314	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	NARA ready service ammunition locker	Small arms/pyrotechnic storage shed – Vacant	Storage shed

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
315	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	NARA ready service ammunition locker	Small arms/pyrotechnic storage shed – Vacant	Storage shed
316	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	NARA ready service ammunition locker	Small arms/pyrotechnic storage shed – Vacant	Storage shed
317	Not listed	Credit Union	Ammunition locker	Ammunition locker	Corporate yard office and storage shed	Not listed	Storage shed
318	Not listed	Channel range light	Channel range light	Storage shed, channel range light	Storage shed, channel range light	Demolished - 1986	Not listed
319	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	NARA ready service ammunition locker	Small arms/pyrotechnic storage shed – Vacant	Storage shed
320	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	NARA ready service ammunition locker	Small arms/pyrotechnic storage shed – Vacant	Storage shed
321	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	NARA ready service ammunition locker	Hazardous flammable storage shed – Vacant	Storage shed

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
322	Not listed	Ammunition locker	Ammunition locker	Ammunition locker	Ready magazine	Hazardous flammable storage shed	Storage shed
323	Not listed	High frequency radio direction finder	Demolished 1950	Not listed	Not listed	Not listed	Not listed
324	Not listed	Steel storage tank	Steel storage tank	Storage	General warehouse	Demolished - 1986	Not listed
325	Not listed	Steel storage tank	Steel storage tank	Storage	General warehouse	Demolished - 1986	Not listed
326	Not listed	Steel storage tank	Steel storage tank	Storage	NARA general warehouse	Demolished - 1986	Not listed
327	Not listed	Steel storage tank	Steel storage tank	Storage	General warehouse	Demolished - 1986	Not listed
328	Not listed	Steel storage tank	Steel storage tank	Storage	Maintenance air training facility and medical storage	Demolished - 1986	Not listed
329	Not listed	Motor generator house	Motor generator house	NARA line maintenance shelter	NARA line maintenance shelter	Demolished - 1995	Not listed
330	Not listed	Aircraft handling equipment storage	Aircraft handling equipment storage	NARF sheet metal shop, aircraft overhaul plant	NARF sheet metal shop, aircraft overhaul plant	Demolished - 1995	Not listed

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TABLE 3-4
NAVAL AIR STATION - ALAMEDA
BUILDING USE CHRONOLOGY

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331	Not listed	Aircraft handling equipment storage	Aircraft handling equipment storage	NARF carpenter shop, aircraft overhaul plant	NARF carpenter shop, aircraft overhaul plant	Demolished - 1995	Not listed
332	Not listed	Shop service garage	Shop service garage	Not listed	Not listed	Not listed	Unknown
333	Not listed	Hobby shop garage	Hobby shop garage	Demolished	Not listed	Not listed	Not listed
334	Not listed	Hazardous material storage, ARMCO hut	Hazardous material storage, ARMCO hut	NARF line shack	NARA lube storage	Demolished - 1995	Not listed
335	Not listed	Hazardous material storage, ARMCO hut	Hazardous material storage, ARMCO hut	Line shack	NARA lube storage	FMAG-46 hazardous and flammable storage	Demolished
336	Not listed	Hazardous material storage, ARMCO hut	Hazardous material storage, ARMCO hut	Line maintenance shelter	Line maintenance shelter	Demolished - 1995	Not listed
337	Not listed	Storage, ARMCO hut	Storage, ARMCO hut	ARMCO storage	SIMA hazardous and flammable storage	SIMA hazardous and flammable storage	Not listed
338A-1	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material staging facility	Plant services, aircraft overhaul	Not listed
338A-2	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material staging facility	Plant services, aircraft overhaul	Not listed
338B-0	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material staging facility	Plant services, aircraft overhaul	Not listed

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
338B-1	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material staging facility	Plant services, aircraft overhaul	Not listed
338B-2	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material staging facility	Plant services, aircraft overhaul	Not listed
338C-1	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material and equipment staging	Material and equipment staging	Not listed
338C-2	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material and equipment staging	Material and equipment staging	Not listed
338D-3	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material and equipment staging	Material and equipment staging	Not listed
338D-4	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material and equipment staging	Material and equipment staging	Not listed
338E-3	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material staging facility	Plant services, aircraft overhaul	Not listed
338F-1	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material and equipment staging	Material and equipment staging	Not listed
338F-2	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material and equipment staging	Material and equipment staging	Not listed

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TABLE 3-4
NAVAL AIR STATION - ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
338G-1	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material and equipment staging	Material and equipment staging	Not listed
338G-2	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material and equipment staging	Material and equipment staging	Not listed
338H-1	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material and equipment staging	Material and equipment staging	Not listed
338H-2	Not listed	Aircraft containers	Aircraft containers	Aircraft containers	Material and equipment staging	Material and equipment staging	Not listed
339	Not listed	Not listed	Skeet range ammunition locker	Skeet range small arms pyrotechnic magazine, ammo storage shed	Skeet range small arms pyrotechnic magazine, ammo storage shed	Skeet range small arms pyrotechnic magazine, ammo storage shed	Demolished
340	Not listed	Not listed	Pump house, fire protection	Pump house, fire protection	PWC water distribution building	Fire protection pump house	Vacant
341	Not listed	Not listed	Fuel oil pumping station	Aviation fuel pumping station	Not listed	Not listed	Unknown

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
342A	Not listed	Not listed	7,500 gallon fuel oil storage (converted to aviation storage facility in 1957)	Aviation fuel storage tank	Activity heating fuel storage	Aviation storage and tank truck/car loading facility	In use
342B	Not listed	Not listed	7,500 gallon fuel oil storage (converted to aviation storage facility in 1957)	Aviation fuel storage tank	Activity heating fuel oil storage	Activity heating fuel oil storage	In use
343	Not listed	Not listed	Shop stores	NARF shop stores	NARF Aircraft overhaul plant services	NADEP Aircraft overhaul plant services	Demolished
344	Not listed	Not listed	Joiner and sheet metal shops	NARF joiner and sheet metal shops	NARF Aircraft overhaul plant services	Aircraft overhaul plant services – Vacant	Demolished
345	Not listed	Not listed	Welding shop	NARF welding shop	NARF Aircraft overhaul plant services	NADEP Aircraft overhaul plant services	Demolished
346	Not listed	Not listed	Drop tank cleaning shop	NARF electrical shop	NARF materials engineering lab	NADEP materials engineering lab	Vacant
347	Not listed	Not listed	Paint and dope storage and mixing room	NARF paint mixing and finishing shop	NARF paint mixing and finishing hangar	NADEP paint mixing and finishing shop	Storage shed
348	Not listed	Not listed	Cleaning shelter	NARF cleaning facility	NARF paint finishing hangar	Not listed	Demolished

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
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349	Not listed	Not listed	Phenolic resin process building	NARF Aircraft engine accessory overhaul shop	NARF Aircraft engine accessory overhaul shop	NADEP Aircraft engine accessory overhaul shop	Demolished
350	Not listed	Not listed	CPO Club storage	CPO Club storage	CPO mess storage	<i>Not listed</i>	Demolished
351	Not listed	Not listed	Maintenance building, ARMCO hut	ARMCO hut storage	NARF paint finishing hangar	Corrosion control shop – Vacant	Not listed
352	Not listed	Not listed	Maintenance building, ARMCO hut	ARMCO hut salvage shop	NARF salvage shop	Demolished - 1977	Not listed
353	Not listed	Not listed	Not listed	High explosive magazine	High explosive magazine	High explosive magazine; used for storage of radiological anomalies 1990's	Small amount of radioactive material stored inside bunker (temporarily)
354	Not listed	Not listed	Not listed	High explosive magazine	High explosive magazine	High explosive magazine	Unknown
355	Not listed	Not listed	Not listed	Fuse and detonator magazine	Fuse and detonator magazine	Small arms/pyrotechnic magazine	Empty bunker
356	Not listed	Not listed	Not listed	Fuse and detonator magazine	Fuse and detonator magazine	High explosives magazine	Empty bunker

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**TABLE 3-4
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357	Not listed	Not listed	Not listed	Fuse and detonator magazine	Fuse and detonator magazine	Small arms/pyrotechnic magazine	Empty bunker
358	Not listed	Not listed	Not listed	Fuse and detonator magazine	Fuse and detonator magazine	Fuse and detonator magazine	Empty bunker
359	Not listed	Not listed	Not listed	Fuse and detonator magazine	Fuse and detonator magazine	High explosive magazine	Empty bunker
360	Not listed	Not listed	Not listed	Aircraft engine overhaul building	Aircraft engine overhaul building and cleaning, painting and plating shop	Aircraft engine overhaul building	Vacant
360A, B, C, D. Engine component storage facility	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
361	Not listed	Not listed	Not listed	Storehouse	General warehouse	Not listed	Demolished
362	Not listed	Not listed	Not listed	Storehouse	General warehouse	Not listed	Demolished
363	Not listed	Not listed	Not listed	Storehouse	Disposal salvage scrap building	Not listed	Demolished
364	Not listed	Not listed	Not listed	Storehouse	Disposal salvage scrap building	Not listed	Demolished

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**TABLE 3-4
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365	Hangar	Hangar	Hangar	Storehouse	Covered storage building (DRMO)	Not listed	Demolished
366	Not listed	Not listed	Not listed	Storehouse	Screening lot office building (DRMO)	Not listed	Demolished
Scrap Yard (approx. 9 acres)	Not listed	Not listed	Not listed	Scrap Yard	Screening lot and scrap yard (DRMO)	Not listed	Vacant
367	Not listed	Not listed	Not listed	Scrap bins	Scrap bin storage area (DRMO)	Not listed	Demolished
368	Not listed	Not listed	Not listed	Storehouse, receiving	General warehouse in supply annex	Not listed	Demolished
369	Not listed	Not listed	Not listed	Storehouse	General warehouse in supply annex	Not listed	Demolished
370	Not listed	Not listed	Not listed	Storehouse	General warehouse in supply annex	Not listed	Demolished
371	Not listed	Not listed	Not listed	Storehouse	General warehouse in supply annex	Not listed	Demolished
372	Not listed	Not listed	Not listed	Turbo-prop engine test cell	Turbo-prop engine test cell	Turbo-prop engine test cell	Secured

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
373	Not listed	Not listed	Not listed	Aviation fuel storage structure and aviation truck fueling facility	Aviation fuel storage structure and aviation truck fueling facility	Aviation fuel storage structure and aviation truck fueling facility	Not in use
374A	Not listed	Not listed	Not listed	Aviation fuel tank	Jet engine fuel storage	Not listed	Demolished
374B	Not listed	Not listed	Not listed	Aviation fuel tank	Jet engine fuel storage	Jet engine fuel storage	Demolished
375	Not listed	Not listed	Not listed	Aviation fuel truck unloading	Tank truck car unloading facility and office	Tank truck car unloading facility and office	Unknown
376	Not listed	Not listed	Not listed	Aviation fuel transformer house	Aviation fuel transformer house	Aviation fuel transformer house	Unknown
377	Not listed	Not listed	Not listed	Aviation fuel ready room	Aviation fuel ready room and tank truck loading facility	Tank truck loading facility	Vacant
377A	Not listed	Not listed	Not listed	Not listed	Not listed	Fuel department lounge	Vacant
377B	Not listed	Not listed	Not listed	Not listed	Not listed	Fuel department shop	Unknown
378	Not listed	Not listed	Not listed	NARTU paint locker	General storage and NARA lube storage	General storage – Vacant	Demolished

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**TABLE 3-4
NAVAL AIR STATION - ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
379A	Not listed	Not listed	Not listed	Ready room office and GCA unit building	Ready room office and GCA unit building	Demolished - 1989	Not listed
379B	Not listed	Not listed	Not listed	Shop tool room	Shop tool room	Demolished - 1989	Not listed
380	Not listed	Not listed	Not listed	Saluting battery gun mount	Saluting battery gun mount	Saluting battery gun mount	Unknown
381	Not listed	Not listed	Not listed	Playing field/baseball bleachers	Playing field/baseball bleachers	Playing field/baseball bleachers	Demolished
382	Not listed	Not listed	Not listed	Squash courts	Squash courts	Squash courts	Vacant
383	Not listed	Not listed	Not listed	Wading pool	Wading pool	Demolished - 1995	Not listed
384	Not listed	Not listed	Not listed	Flag pole	Flag pole	Flag pole	Unknown
385	Not listed	Not listed	Not listed	Boathouse, Exchange snack stand	Boathouse, Exchange snack stand and Laundromat	Boathouse, Exchange snack stand	Port services
386	Not listed	Not listed	Not listed	Line shack	Aircraft line ops building	Aircraft line ops building	Demolished
387	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Flagpole
388	Not listed	Not listed	Not listed	Inert storehouse ARMCO hut	Inert storehouse	Inert storehouse	Vacant, BRAC lock
389	Not listed	Not listed	Not listed	General warehouse	General warehouse	Station security	Not listed

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
390	Not listed	Not listed	Not listed	Line shack	FMAG-46 line maintenance shelter	FMAG-46 line maintenance shelter	Demolished
391	Not listed	Not listed	Not listed	Storage shelter	General warehouse and paint storage	General warehouse and paint storage	Not listed
392	Not listed	Not listed	Not listed	Emergency generator house	Emergency stand-by generator building	Emergency stand-by generator building	Not listed
393	Not listed	Not listed	Not listed	Refueler repair shelter	PWC auto vehicle maintenance	COMNAVAIR-PAC paint and blasting shop	Not listed
394	Not listed	Not listed	Not listed	Pallet repair shelter	Demolished - 1976	Not listed	Not listed
395	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
396	Not listed	Not listed	Not listed	Line shack	Demolished - 1976	Not listed	Not listed
397	Not listed	Not listed	Not listed	Jet engine test cell	Jet engine test cell	Jet engine test cell	Not listed
398	Not listed	Not listed	Not listed	Aircraft engine overhaul shop	Aircraft engine and accessory overhaul shop	Aircraft engine and accessory overhaul shop	Vacant
399	Not listed	Not listed	Not listed	Aircraft compressor support	Aircraft engine overhaul and testing	Aircraft compressor support	Vacant

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TABLE 3-4
NAVAL AIR STATION - ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
400	Not listed	Not listed	Not listed	Avionics building, aircraft maintenance hangar, overhaul, manufacture and repair	Avionics building, aircraft maintenance hangar, overhaul, manufacture and repair	Avionics building, aircraft maintenance hangar, overhaul, manufacture and repair	Radiation survey completed in 2000 and close-out report issued in 2001; Industrial facility
Storm/sanitary drain adjacent to Bldg 400	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Radium contamination was found inside the piping in 1996 and was remediated (partial) in 1998 and 1999.
401	Not listed	Not listed	Not listed	Bus shelter	Bus shelter	Demolished	Not listed
402	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
403	Not listed	Not listed	Not listed	Outdoor pistol range, small arms range	Outdoor pistol range, small arms range	Outdoor pistol range, small arms range	Demolished
404	Not listed	Not listed	Not listed	Skeet range	Skeet range	Skeet range	Demolished
405	Not listed	Not listed	Not listed	Aircraft components storage	Plant services for aircraft overhaul, aircraft ground support equipment storage shop	Plant services for aircraft overhaul, aircraft ground support equipment storage shop	Vacant

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
406	Not listed	Not listed	Not listed	GEMD and TACAN unit building	GEMD and TACAN unit building	GEMD and TACAN unit building	Demolished
407	Not listed	Not listed	Not listed	LOX facility	LOX and liquid nitrogen facility	LOX and liquid nitrogen facility	Unknown
408	Not listed	Not listed	Not listed	Hobby shop, automotive	Hobby shop, automotive	Navy exchange central support	Demolished
409	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Unknown
410	Not listed	Not listed	Not listed	Aircraft paint cleaning and stripping shelter	Aircraft paint cleaning and stripping shelter	Aircraft paint cleaning and stripping shelter	Secured
411	Not listed	Not listed	Not listed	Electrical Substation No. 4	Not listed	Electrical Substation No. 4	In use
412	Not listed	Not listed	Not listed	Electrical Substation No. 2	Not listed	Electrical Substation No. 2	Unknown
413	Not listed	Not listed	Not listed	Electrical Substation No. 3	Not listed	Not listed	Unknown
414	Not listed	Not listed	Not listed	Chemical storage building	Chemical storage building	Hazardous flammable storage	Occupied
415	Not listed	Not listed	Not listed	Cleaning fluid tanks	Miscellaneous liquid storage	Miscellaneous liquid storage	Demolished
416	Not listed	Not listed	Not listed	CPO mess open storage	CPO mess open storage	Golf shed	Demolished
417	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Unknown

**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
418	Not listed	Not listed	Not listed	Boat repair shop	Boat repair shop	Demolished - 1988	Not listed
419	Not listed	Not listed	Not listed	Officer's Club barbeque	Officer's Club barbeque	Officer's Club barbeque	Unknown
420	Not listed	Not listed	Not listed	AUW special weapons, torpedo shop	AUW special weapons, torpedo shop	Torpedo shop	Vacant
421	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
422	Not listed	Not listed	Not listed	Baseball field and backstop	Baseball field and backstop	Baseball field and backstop	Vacant
423	Not listed	Not listed	Not listed	Fenced tennis courts and storage shed	Fenced tennis courts and storage shed	Fenced tennis courts and storage shed	Vacant
424	Not listed	Not listed	Not listed	Playing field - softball	Playing field - softball	Playing field - softball	Vacant
425	Not listed	Not listed	Not listed	Playing field - softball	Playing field - softball	Playing field - softball	Vacant
426	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
427	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
428	Not listed	Not listed	Not listed	Not listed	Playing field	Playing field	Vacant
429	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
430	Not listed	Not listed	Not listed	Aircraft truck fueling facility	Aircraft truck fueling facility	Not listed	Demolished
431	Not listed	Not listed	Not listed	Mooring dolphin	Mooring dolphin	Mooring dolphin	Not in use
432	Not listed	Not listed	Not listed	Mooring dolphin	Not Listed	Not Listed	Unknown
433	Not listed	Not listed	Not listed	Not Listed	Not Listed	Not Listed	Not listed

TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
434	Not listed	Not listed	Not listed	Mooring dolphin	Mooring dolphin	Mooring dolphin	Not in use
435	Not listed	Not listed	Not listed	Mooring dolphin	Not Listed	Not Listed	Unknown
436	Not listed	Not listed	Not listed	Five inch gun	Not Listed	Not Listed	Unknown
437	Not listed	Not listed	Not listed	Ship's bell	Ship's bell	Not Listed	Demolished
438	Not listed	Not listed	Not listed	Aircraft truck fueling facility	Aircraft truck fueling facility	Aircraft truck fueling facility	Unknown
439	Not listed	Not listed	Not listed	Sewage pumping station	Not listed	Sewage pumping station	Not in use
440	Not listed	Not listed	Not listed	Control center	Guard and watch tower, control center	Guard and watch tower, control center	Vacant
441	Not listed	Not listed	Not listed	Sentry house	Guard and watch tower	Guard and watch tower	Vacant
442	Not listed	Not listed	Not listed	Control tower	Guard and watch tower	Guard and watch tower	Vacant
443	Not listed	Not listed	Not listed	Fire school gear locker	Fire school gear locker	Not listed	Demolished
444	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
445	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
446	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
447	Not listed	Not listed	Not listed	Storage center	Boat shop	Not listed	Demolished
448	Not listed	Not listed	Not listed	Sewage pumping station	Not listed	Sewage pumping station	Unknown
449	Not listed	Not listed	Not listed	Sewage pumping station	Not listed	Sewage pumping station	Not in use

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
450	Not listed	Not listed	Not listed	Aerological facility, cloud height set	NWSC meteorological facility	NWSC meteorological facility	Unknown
451	Not listed	Not listed	Not listed	Automatic weather station	NWSC meteorological facility	NWSC meteorological facility	Unknown
452	Not listed	Not listed	Not listed	Transmissometer	NWSC meteorological facility	NWSC meteorological facility	Not in use
453	Not listed	Not listed	Not listed	Incinerator	Not listed	Not listed	Unknown
454	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
455	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
456	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Unknown
457	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
458	Not listed	Not listed	Not listed	Golf course	Golf course	Golf course	Demolished
459	Not listed	Not listed	Not listed	Exchange auto repair and service station	Exchange auto repair and service station	Exchange auto repair and service station	Gas station
460 (A)	Not listed	Not listed	Not listed	Aircraft defueling facility	Aircraft overhaul and repair shop	Aircraft de- fueling facility	Unknown
461A, B, C	Not listed	Not listed	Not listed	Jet run-up stands	Aircraft power check facility with sound suppression	Aircraft power check facility with sound suppression	Demolished

**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
462	Not listed	Not listed	Not listed	General warehouse, fleet support	General warehouse, fleet support	General warehouse – Vacant	Demolished
463	Not listed	Not listed	Not listed	Radar control center (MARTD)	General warehouse	General warehouse	Demolished
464	Not listed	Not listed	Not listed	Van shelter (MARTD)	General storage shed	General storage shed – Vacant	Vacant
465	Not listed	Not listed	Not listed	Shop and classroom (MARTD)	Administrative office and warehouse	General storage shed – Vacant	Demolished
466	Not listed	Not listed	Not listed	Aircraft arresting gear	Aircraft arresting gear	Aircraft arresting gear	Unknown
467	Not listed	Not listed	Not listed	Aircraft arresting gear	Aircraft arresting gear	Aircraft arresting gear	Unknown
468	Not listed	Not listed	Not listed	Sewage pumping station	Not Listed	Not Listed	Demolished
469	Not listed	Not listed	Not listed	Sewage pumping station	Not Listed	Not Listed	Unknown
470	Not listed	Not listed	Not listed	Air vacuum pumping building	Aircraft and engine overhaul, repair and testing	Aircraft and engine overhaul, repair and testing	Vacant
471	Not listed	Not listed	Not listed	Office and storage	Aircraft overhaul plant services	Aircraft overhaul plant services	Demolished
472	Not listed	Not listed	Not listed	Lumber storage	Aircraft overhaul plant services	Aircraft overhaul plant services	Demolished

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
473	Not listed	Not listed	Not listed	Metal shear shop	Aircraft overhaul plant services	Aircraft overhaul plant services	Demolished
474	Not listed	Not listed	Not listed	Welding shop	Aircraft overhaul plant services	Aircraft overhaul plant services	Demolished
475	Not listed	Not listed	Not listed	Spray paint shop	Aircraft overhaul plant services	Aircraft overhaul plant services – Vacant	Demolished
476	Not listed	Not listed	Not listed	Paint locker	Hazardous flammable storage	Aircraft overhaul plant services	Demolished
477	Not listed	Not listed	Not listed	Spray paint shop	Aircraft overhaul plant services	Aircraft overhaul plant services – Vacant	Demolished
478	Not listed	Not listed	Not listed	Saw shop	Aircraft overhaul plant services	Not listed	Demolished
479	Not listed	Not listed	Not listed	Paint locker	Aircraft overhaul plant services	Hazardous flammable storage - Vacant	Demolished
480	Not listed	Not listed	Not listed	Wind direction indicator, Tetrahedron	Wind direction indicator, Tetrahedron	Wind direction indicator, Tetrahedron	Not in use
481	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
482	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
483	Not listed	Not listed	Not listed	Aircraft arresting gear	Aircraft arresting gear	Aircraft arresting gear	Demolished
484	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
485	Not listed	Not listed	Not listed	Aircraft arresting gear	Aircraft arresting gear	Aircraft arresting gear	Demolished
486	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
487	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
488	Not listed	Not listed	Not listed	Field compass calibration pad	Field compass calibration pad	Field compass calibration pad	Not in use
489	Not listed	Not listed	Not listed	Field compass calibration pad	Field compass calibration pad	Not listed	Demolished
490	Not listed	Not listed	Not listed	Ready room	Line maintenance shelter	Not listed	Demolished
491	Not listed	Not listed	Not listed	Emergency generator building	PWC stand-by generator building	PWC stand-by generator building	In use
492	Not listed	Not listed	Not listed	Sewage pumping station	Not Listed	Sewage pumping station	Demolished
493	Not listed	Not listed	Not listed	Sewage pumping station	Sewage pumping station	Sewage pumping station	In use
494	Not listed	Not listed	Not listed	Office and maintenance building	Aircraft overhaul, repair and maintenance shop	Maintenance building	Secured
495	Not listed	Not listed	Not listed	Arresting gear	Arresting gear	Not listed	Demolished
496	Not listed	Not listed	Not listed	GCA turntable system	GCA turntable system	GCA turntable system	Demolished

TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
497	Not listed	Not listed	Not listed	Multi-cubicle (7-cell) weapons bunker	Multi-cubicle (7-cell) weapons bunker	Multi-cubicle (7-cell) weapons bunker; possible storage of special weapons	Radiation survey completed in 1999; no radioactivity found – vacant
498	Not listed	Not listed	Not listed	Sentry tower	Guard and watch sentry tower	Guard and watch sentry tower	Vacant
499	Not listed	Not listed	Not listed	GEMD air field lighting vault	Electrical distribution building shelter	GEMD air field lighting vault	Not in use
500	Not listed	Not listed	Not listed	Transit shed receiving building	Transit shed receiving building	Transit shed receiving building	Unknown
501	Not listed	Not listed	Not listed	Aircraft sanitary facility	PWC sewage pump station shed shelter	PWC sewage pump station shed shelter	In use
502	Not listed	Not listed	Not listed	Mooring dolphin	Mooring dolphin	Mooring dolphin	Unknown
503	Not listed	Not listed	Not listed	Gate sentry house	Gate sentry house	Gate sentry house	Vacant
504	Not listed	Not listed	Not listed	Sentry house	Sentry house	Sentry house	Demolished
505	Not listed	Not listed	Not listed	Electrical substation	Electrical substation	Electrical substation	Unknown
506	Not listed	Not listed	Not listed	Hobby shop grease rack	Hobby shop grease rack	Navy exchange, maintenance & production storage	Demolished

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
507	Not listed	Not listed	Not listed	Aircraft repair and maintenance shop shed	Aircraft repair and maintenance shop shed	Aircraft repair and maintenance shop shed	Demolished
508	Not listed	Not listed	Not listed	Aircraft repair and maintenance shop shed	Aircraft repair and maintenance shop shed	Aircraft repair and maintenance shop shed	Demolished
509	Not listed	Not listed	Not listed	Picnic playground	Picnic playground	Not listed	Demolished
510	Not listed	Not listed	Not listed	LOX facility	Aircraft overhaul repair and maintenance shop	Aircraft overhaul repair and maintenance shop	Demolished
511	Not listed	Not listed	Not listed	Arresting gear	Arresting gear	Arresting gear	Unknown
512	Not listed	Not listed	Not listed	Dolphin	Ship beacon	Ship beacon	Unknown
513	Not listed	Not listed	Not listed	Wheels-up, wave-off lighting shack	Wheels-up, wave-off lighting shack	Wheels-up, wave-off lighting shack	Not in use
514	Not listed	Not listed	Not listed	Wheels-up, wave-off lighting shack	Wheels-up, wave-off lighting shack	Wheels-up, wave-off lighting shack	Not in use
515	Not listed	Not listed	Not listed	Mk 4 pod test facility	Light gun shop and gun test facility	Not listed	Demolished
516	Not listed	Not listed	Not listed	Special weapons magazine	Special weapons magazine	Small arms and pyrotechnic magazine	Demolished

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**TABLE 3-4
NAVAL AIR STATION - ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
517	Not listed	Not listed	Not listed	General store, Navy exchange service outlets	General store, Navy exchange service outlets	General store, Navy exchange service outlets	Retail
518	Not listed	Not listed	Not listed	Compass calibration support building	Compass calibration support building and small arms storage	Control console station	Demolished
519	Not listed	Not listed	Not listed	Compass calibration support building	Compass calibration support building	Field monitor station	Demolished
520	Not listed	Not listed	Not listed	Aircraft compass calibration pad	Aircraft compass calibration pad	Not listed	Demolished
521	Not listed	Not listed	Not listed	Outdoor mounted A-4 aircraft	Outdoor mounted A-4 aircraft	Outdoor mounted A-4 aircraft	On display
522	Not listed	Not listed	Not listed	Administrative (CEWRA) office	Administrative (CEWRA) office	Administrative (CEWRA) office	Administrative
523	Not listed	Not listed	Not listed	Line crew shelter	Aircraft overhaul repair shop	Covered ground check flight test	Demolished
524	Not listed	Not listed	Not listed	Office and ready room (SEABEEs)	Public Works shop	Office (SEABEEs)	Demolished
525	Not listed	Not listed	Not listed	Bowling alley, 24-lanes	Bowling alley, 24-lanes	Bowling alley, 24-lanes	Commercial, Auctions by the Bay

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
526	Not listed	Not listed	Not listed	Line maintenance shelter, NARA training unit maintenance shop	PWC public works shop	Demolished - 1995	Not listed
527	Not listed	Not listed	Not listed	AFES credit union	AFES credit union	AFES credit union	Occupied, commercial
528	Not listed	Not listed	Not listed	Maintenance building (SEABEEs)	PWC Auto vehicle maintenance	Heavy equipment maintenance (SEABEEs)	Demolished
529	Not listed	Not listed	Not listed	Mechanics building	Not listed	Mechanics building	Vacant
530	Not listed	Not listed	Not listed	Missile rework and test shop	Missile rework and test shop	Missile rework and test shop	Occupied. Alameda Aerospace
531	Not listed	Not listed	Not listed	Temporary Navy lodging	Temporary Navy lodging	Temporary Navy lodging	Unknown
532	Not listed	Not listed	Not listed	Temporary Navy lodging	Temporary Navy lodging	Temporary Navy lodging	Demolished
533	Not listed	Not listed	Not listed	Temporary Navy lodging	Temporary Navy lodging	Temporary Navy lodging	Unknown
534	Not listed	Not listed	Not listed	Concrete slab – automated post office	Concrete slab – automated post office	PWC housing office	Unknown

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
535	Not listed	Not listed	Not listed	Not listed	Tide gauge building, Pier 3	Port services degaussing building	In use
536	Not listed	Not listed	Not listed	Not listed	NARA maintenance shop	Line maintenance shelter – Vacant	Demolished
537	Not listed	Not listed	Not listed	Not listed	NARA maintenance shop	Line maintenance shelter - Vacant	Demolished
538	Not listed	Not listed	Not listed	Not listed	NARA maintenance shop	Line maintenance shelter	Demolished
539	Not listed	Not listed	Not listed	Not listed	NARA maintenance shop	Line maintenance shelter	Unknown
540	Not listed	Not listed	Not listed	Not listed	Maintenance shop	Aircraft spare storage	Demolished
541	Not listed	Not listed	Not listed	Not listed	Maintenance shop	Line maintenance shelter	Unknown
542	Not listed	Not listed	Not listed	Not listed	Fleet recreation building	Fleet recreation building	Vacant
543	Not listed	Not listed	Not listed	Not listed	Wells air start system	Wells air start system	Demolished
544	Not listed	Not listed	Not listed	Not listed	LOX facility	LOX facility	Unknown

TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
545	Not listed	Not listed	Not listed	Not listed	Community center	Temporary child care for housing	Unknown
546	Not listed	Not listed	Not listed	Not listed	Bus stop	Bus stop	Unknown
547	Not listed	Not listed	Not listed	Not listed	Base service (express gas) station	Base service (express gas) station	Demolished
548	Not listed	Not listed	Not listed	Not listed	Navy exchange mobile trailer	Not listed	Demolished
549	Not listed	Not listed	Not listed	Not listed	AIMD helicopter maintenance building	AIMD line maintenance shack	Demolished
550	Not listed	Not listed	Not listed	Not listed	PWC grounds maintenance building	PWC grounds maintenance building	Occupied
551	Not listed	Not listed	Not listed	Not listed	PWC sewage holding tank and building	PWC sewage holding tank and building	Vacant
552	Not listed	Not listed	Not listed	Not listed	Not listed	Main electrical substation	In use
553	Not listed	Not listed	Not listed	Not listed	Not listed	Electrical substation No. 6	Unknown
554	Not listed	Not listed	Not listed	Not listed	Not listed	Electrical substation No. 7	In use
555	Not listed	Not listed	Not listed	Not listed	Not listed	Electrical substation No. 6	In use

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
556	Not listed	Not listed	Not listed	Not listed	Not listed	Sewer lift station pump	Unknown
557	Not listed	Not listed	Not listed	Not listed	Not listed	Electrical distribution line	In use
558	Not listed	Not listed	Not listed	Not listed	Not listed	Electrical substation No. 14	In use
559	Not listed	Not listed	Not listed	Not listed	Not listed	Electrical substation No. 9	Unknown
560	Not listed	Not listed	Not listed	Not listed	Not listed	Electrical substation No. 5	Unknown
561	Not listed	Not listed	Not listed	Not listed	Not listed	Electrical substation No. 11	In use
562	Not listed	Not listed	Not listed	Not listed	Sewage pump station	Sewage pump station	In use
563	Not listed	Not listed	Not listed	Not listed	Relocated skeet and target range with shed, fence and flag pole	Demolished - 1995	Not listed
564	Not listed	Not listed	Not listed	Not listed	Consolidated liquor store	Consolidated liquor store	Community Bible Church
565	Not listed	Not listed	Not listed	Not listed	Recreation building	Recreation building	Demolished
566	Not listed	Not listed	Not listed	Not listed	Guard/watch tower	Guard/watch tower	Demolished
567	Not listed	Not listed	Not listed	Not listed	Arresting gear	Arresting gear	Demolished

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
568	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
569	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
570	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1992	Not listed
571	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
572	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
573	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
574	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
575	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
576	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
577	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
578	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
579	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
580	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed

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TABLE 3-4
NAVAL AIR STATION - ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
581	Not listed	Not listed	Not listed	Not listed	Ready service ammo locker	Demolished - 1995	Not listed
582	Not listed	Not listed	Not listed	Not listed	NARA line shack	Detached wash rack	Demolished
583	Not listed	Not listed	Not listed	Not listed	FAA outer marker facility	FAA outer marker facility	Not listed
584	Not listed	Not listed	Not listed	Not listed	Not listed	Power plant, air/steam plant for ships	Occupied
585	Not listed	Not listed	Not listed	Not listed	CPO mess open (Top 4 Club)	CPO mess open (Top 4 Club)	Social Services
586	Not listed	Not listed	Not listed	Not listed	Not listed	Sewage lift station	Not in use
587	Not listed	Not listed	Not listed	Not listed	Not listed	Industrial waste pump station #2	Unknown
588	Not listed	Not listed	Not listed	Not listed	Not listed	Industrial waste pump station #3	Demolished
589	Not listed	Not listed	Not listed	Not listed	Not listed	Industrial waste pump station #4	Unknown
590	Not listed	Not listed	Not listed	Not listed	Not listed	Industrial waste pump station #5	Unknown
591	Not listed	Not listed	Not listed	Not listed	Not listed	Sewage pump station	Unknown
592	Not listed	Not listed	Not listed	Not listed	Not listed	Sewage pump station	Vacant
593	Not listed	Not listed	Not listed	Not listed	Not listed	Sewage lift pump	Unknown

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
594	Not listed	Not listed	Not listed	Not listed	Reaction force facility	Reaction force facility	Vacant
595	Not listed	Not listed	Not listed	Not listed	Oxygen cartridge facility	Oxygen cartridge facility	Occupied
596	Not listed	Not listed	Not listed	Not listed	Not listed	Sewage lift station	Not in use
597	Not listed	Not listed	Not listed	Not listed	Not listed	Sewage lift pump	Demolished
598	Not listed	Not listed	Not listed	Not listed	Avgas facility	Aircraft fuel storage	Demolished
599	Not listed	Not listed	Not listed	Not listed	Not listed	Arresting gear	Unknown
600	Not listed	Not listed	Not listed	Not listed	Not listed	Coolant supply building	Occupied
601	Not listed	Not listed	Not listed	Not listed	Not listed	Oil spill and clean-up facility	Occupied
602	Not listed	Not listed	Not listed	Not listed	Not listed	Generator building	Demolished
603	Not listed	Not listed	Not listed	Not listed	Not listed	Aircraft spares building	Demolished
604	Not listed	Not listed	Not listed	Not listed	Not listed	Sandblast equipment storage	Demolished
605	Not listed	Not listed	Not listed	Not listed	Not listed	Generator building	Demolished
606	Not listed	Not listed	Not listed	Not listed	Not listed	Aircraft rework building	Demolished

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
607	Not listed	Not listed	Not listed	Not listed	Not listed	Craft hobby shop	Alameda Pt. Collaborative
608 A, B, C	Not listed	Not listed	Not listed	Not listed	Not listed	Auto hobby shop	Commercial
609	Not listed	Not listed	Not listed	Not listed	Not listed	Transformer	Demolished
610	Not listed	Not listed	Not listed	Not listed	Not listed	Speed grinder facility	Vacant
611	Not listed	Not listed	Not listed	Not listed	Not listed	GEMD electronic repair garage	Unknown
612	Not listed	Not listed	Not listed	Not listed	Not listed	PWC hose/cable storage and test facility	Commercial, Advance Roofing Service
613	Not listed	Not listed	Not listed	Not listed	Not listed	Family service center	Unknown
614	Not listed	Not listed	Not listed	Not listed	Not listed	Hazardous material storage	Vacant
615	Not listed	Not listed	Not listed	Not listed	Not listed	Hazardous material storage	Secured
616	Not listed	Not listed	Not listed	Not listed	Not listed	Hazardous material storage	Occupied; NRC Environmental Services
617	Not listed	Not listed	Not listed	Not listed	Not listed	Equipment storage building - Vacant	Vacant

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
618	Not listed	Not listed	Not listed	Not listed	Not listed	Pavement and grounds equipment shed	Occupied
619	Not listed	Not listed	Not listed	Not listed	Not listed	Pavement and grounds equipment shed	Occupied
620	Not listed	Not listed	Not listed	Not listed	Not listed	Four star maintenance building	Secured
621	Not listed	Not listed	Not listed	Not listed	Not listed	PSNS waterfront operations building	Occupied
622	Not listed	Not listed	Not listed	Not listed	Not listed	Steam heating building	Unknown
623	Not listed	Not listed	Not listed	Not listed	Not listed	Aviation gas storage	Unknown
624	Not listed	Not listed	Not listed	Not listed	Not listed	GEMD shop	Occupied
625	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Listed in 1996 – Vacant
626	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Listed in 1996 – Vacant
627	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Listed in 1996 - Vacant

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
Unnumbered shack (located approx. 100 yards west of Bunker 353)	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Demolished. Radioactive anomalies, found just beneath the ground surface were recovered. Restricted access area.
Unnumbered storage locker (mini-sea-land locker positioned near Building 67)	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Storage locker was sent to off-site disposal facility.
Unnumbered former smelter	Not listed	Not listed	Demolished	Not listed	Not listed	Not listed	Demolished. Not listed.
IR Site 1 (78 acres)	1943-1956 Disposal Area; disposals included low-level radioactive wastes between 1943 and 1956	1943-1956 Disposal Area; disposals included low-level radioactive wastes between 1943 and 1956	1943-1956 Disposal Area; disposals included low-level radioactive wastes between 1943 and 1956	Inactive	Inactive	Inactive	Inactive; Restricted access area.

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
IR Site 2 (110 acres)	Not listed	Not listed	Not listed	Landfill; disposals included low- level radioactive waste between 1956 and 1978	Inactive	Inactive	Inactive; Restricted access area.
IR Site 17 Seaplane Lagoon	Active Seaplane Taxi Harbor	Active Seaplane Taxi Harbor	Active Seaplane Taxi Harbor	Active Seaplane Taxi Harbor	Active Seaplane Taxi Harbor	Solid samples collected from the lagoon in 1994 yielded elevated levels of radium	Miscellaneous marine use
Wharf 1 (located between Piers 1 and 2)	Not listed	Not listed	Not listed	Not listed	General purpose berthing	General purpose berthing	Wharf
Wharf 2 (located between Piers 2 and 3)	Not listed	Not listed	Not listed	Not listed	General purpose berthing	General purpose berthing	Wharf
Ramp 1	Not listed	Not listed	Not listed	Not listed	Boat ramp	Boat ramp and parking apron 4 were reported as having radiolum- inescent paint contamination	Abandoned. No contamination was found during survey in 1996.

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**TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY**

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
Ramp 2	Not listed	Not listed	Not listed	Not listed	Boat ramp – for seaplanes	Boat ramp – for seaplanes	Abandoned
Ramp 3	Not listed	Not listed	Not listed	Not listed	Boat ramp – for seaplanes	Boat ramp – for seaplanes	Abandoned
Ramp 4	Not listed	Not listed	Seaplane Transport Dock 4	Seaplane Transport Dock 4	Boat ramp – for seaplanes	Not listed	Abandoned
Dock 5	Not listed	Not listed	Not listed	Not listed	Temporary dock at marina	Temporary dock at marina	Vacant
Pier 1	Not listed	Ship pier	Ship pier	Ship pier	Smallest pier, designed for docking one combat stores ship, replacement oiler ship, or destroyer for general purpose berthing	Currently not structurally sound and not used for berthing purposes	In use (MARAD)
Pier 2	Not listed	Ship pier	Ship pier	Ship pier	Old ferry landing and moorage for Navy vessels (including nuclear ships)	Moorage for Navy vessels (including nuclear ships)	In use (MARAD)

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

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Pier 3	Not listed	Ship pier	Ship pier	Ship pier	Largest pier for mooring Navy vessels (incl. 2 nuclear carriers); crushed Sr-90 deck marker resulted in portion of pier being replaced in 1996	Moorage for Navy vessels (including nuclear ships)	Pier in use by MARAD and ex-USS HORNET
Pier 4	Not listed	Not listed	Not listed	Not listed	Fueling facility – north shore of NAS	Fueling facility – north shore of NAS	Vacant
Pier 5	Not listed	Not listed	Not listed	Not listed	Fleet landing – north shore of NAS	Demolished – 1987	Not listed
North dock	Not listed	Seaplane Transport Dock 1	Seaplane Transport Dock 1	Demolished	Not listed	Not listed	Not listed
Center Dock	Not listed	Seaplane Transport Dock 2	Seaplane Transport Dock 2	Demolished	Not listed	Not listed	Not listed
South Dock	Not listed	Seaplane Transport Dock 3	Seaplane Transport Dock 3	Demolished	Not listed	Not listed	Not listed
CPO 1 thru 30	Not listed	Not listed	Not listed	Not listed	CPO Housing, pre-1950	Not listed	Homeless housing
A	Not listed	COMFAIR – Alameda	COMFAIR – Alameda	COMFAIR – Alameda	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be rehabilitated

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

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B	Not listed	Public Works Officer	Public Works Officer	Public Works Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
C	Not listed	Supply Officer	Supply Officer	Supply Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
D	Not listed	Assembly and Repair Officer	Assembly and Repair Officer	Assembly and Repair Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
E	Not listed	Communications Officer	Communications Officer	Communications Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
F	Not listed	Executive Officer	Executive Officer	Executive Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
G	Not listed	Commanding Officer, NAS	Commanding Officer, NAS	Commanding Officer, NAS	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
H	Not listed	Senior Medical Officer	Senior Medical Officer	Senior Medical Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
I	Not listed	Assistant Assembly & Repair Officer	Assistant Assembly & Repair Officer	Assistant Assembly & Repair Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
J	Not listed	Inspection Officer	Inspection Officer	Inspection Officer	Officer housing, pre-1950	Officer housing, pre-1950	Unknown

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

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K	Not listed	Assistant Supply Officer	Assistant Supply Officer	Assistant Supply Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
L	Not listed	Deputy Commanding Officer, NAS	Deputy Commanding Officer, NAS	Deputy Commanding Officer, NAS	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
M	Not listed	CO, 17 th Fleet, Alameda	CO, 17 th Fleet, Alameda	CO, 17 th Fleet, Alameda	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
N	Not listed	Commanding Officer Marine Barracks	Commanding Officer Marine Barracks	Commanding Officer Marine Barracks	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
O	Not listed	Senior Dental Officer	Senior Dental Officer	Senior Dental Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
P	Not listed	Junior Medical Officer	Junior Medical Officer	Junior Medical Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
Q	Not listed	Assistant Inspection Officer	Assistant Inspection Officer	Assistant Inspection Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
R	Not listed	Not listed	Not listed	Not listed	Officer housing, pre-1950	Officer housing, pre-1950	Unknown
S	Not listed	Assistant Public Works Officer	Assistant Public Works Officer	Assistant Public Works Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished

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TABLE 3-4
NAVAL AIR STATION – ALAMEDA
BUILDING USE CHRONOLOGY

Building/Site Number	1946 Map of U.S Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
T	Not listed	Chief of Staff, COMFAIR Alameda	Chief of Staff, COMFAIR Alameda	Chief of Staff, COMFAIR Alameda	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
U	Not listed	Assistant Executive Officer	Assistant Executive Officer	Assistant Executive Officer	Officer housing, pre-1950	Officer housing, pre-1950	Rental housing – To be demolished
730 - 742	Not listed	Not listed	Not listed	Not listed	Officer housing, pre-1950	Officer housing, pre-1950	Unknown
743 - 784	Not listed	Not listed	Not listed	Not listed	Officer housing, 1950-69	Officer housing, 1950-69	Unknown
785 - 799	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
800 - 837	Not listed	Not listed	Not listed	Not listed	Enlisted housing	Enlisted housing	Unknown
838 - 899	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
900 - 999	Not listed	Not listed	Not listed	Not listed	Enlisted housing, 1950-69	Enlisted housing, 1950-69	Demolished
1000	Not listed	Not listed	Not listed	Not listed	Enlisted housing, 1950-69	Enlisted housing, 1950-69	Demolished
1001 - 1006	Not listed	Not listed	Not listed	Not listed	WO housing, 1950-69	WO housing, 1950-69	Demolished
1007 - 1011	Not listed	Not listed	Not listed	Not listed	Officer housing, 1950-69	Officer housing, 1950-69	Demolished
1012 - 1063	Not listed	Not listed	Not listed	Not listed	Enlisted housing, 1950-60	Enlisted housing, 1950-60	Vacant
1064	Not listed	Not listed	Not listed	Not listed	Sewage pumping station	Sewage pumping station	Not in use
1065 - 2099	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

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TABLE 3-4 NAVAL AIR STATION – ALAMEDA BUILDING USE CHRONOLOGY							
Building/Site Number	1946 Map of U.S. Naval Air Station, Alameda, Ca. (ALA-HRA-22)	1948 Map - Naval Air Station Alameda (ALA-HRA-23)	1950 Map - Naval Air Station Alameda (ALA-HRA-24)	1972 Existing Conditions Index (ALA-HRA-25)	1987 Alameda Master Plan, Table E-2 (ALA-HRA-26)	1994 Alameda Listing Bldgs/Structure (ALA-HRA-27)	1996 - 2005 Former NAS Alameda Building Data Base - 6/22/05 (ALA-HRA-28)
2100 – 2130	Not listed	Not listed	Not listed	Not listed	Picnic playgrounds	Picnic playgrounds	Unknown

Note Secured – Building locked and windows boarded

TABLE 3-5 SCHOOLS LOCATED WITHIN A 1-MILE RADIUS OF FORMER NAS ALAMEDA			
School	Address and Telephone Number	Age Range (Years), or Grade Range	Number of Children in Program
Anderson Community Learning Center	210 Central Ave. 510-521-7123	Grades 7-12	158
Chipman Middle School	401 Pacific Ave. 510-748-4017	Grades 6-8	753
Encinal High School	210 Central Ave. 510-748-4023	Grades 9-12	1,188
George P. Miller Elementary School	250 Singleton Ave. 510-748-4011	Grades K-5	272
Kiddie Kampus Coop Nursery	1711 2 ND St. 510-521-1218	Pre-school	25 families
Longfellow Elementary School	500 Pacific Ave. 510-748-4008	Grades K-5	336
St. Barnabas Elementary School	1400 6 th St. 510-521-0595	Grades K-8	219
Washington Elementary School	825 Taylor Ave. 510-748-4007	Grades K-7	288
William G. Paden Elementary School	444 Central Ave. 510-748-4014	Grades K-8	402
Woodstock Elementary School	1900 3 rd St. 510-748-4012	Grades K-5	291
College of Alameda	555 Atlantic Ave. 510-748-2299	2-year College	Total 5,011 Full-time 1,482

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4.0 HRA METHODOLOGY

An HRA is a tool used by the Navy to provide a comprehensive review and assessment of the impact of radiological operations at Navy or U.S. Marine Corps installations. This section describes the processes used by the Navy to prepare the HRA.

4.1 HRA OVERVIEW

Documentation of operations involving radioactive materials conducted at a Navy or Marine Corps installation, regulatory controls of these operations, and closeout surveys following the operations are vital to the future uses of current and former Navy and Marine Corps property. The Navy uses an HRA to document historical radiological operations at an installation and to recommend future actions. This gives Navy management a critical tool needed to properly control, investigate, and/or release property.

The NAS Alameda HRA, Volume II generally follows the guidelines in the MARSSIM (ALA-HRA-2) for preparation of a Historical Site Assessment and provides information in a format similar to the Preliminary Assessment (PA) protocol used by the EPA within the CERCLA process.

An HRA provides historical documentation of radiological operations for a specified period. The NAS Alameda HRA, Volume II documents radiological operations from establishment of NAS as a Navy facility up to the time of closure and subsequent radiological surveys and investigations through June 2005. Results of other radiological investigations conducted after June 2005 will be reported in separate documents.

4.2 PURPOSE

The purpose of the NAS Alameda HRA, Volume II is to document radiological operations involving G-RAM. This includes the following radiological operations:

- Overhaul and repair of aircraft instruments containing radium painted components
- Inspection, handling, storage, repair, and disposal of aircraft counterweights containing DU
- Operation of gas chromatography analysis equipment utilizing radioactive Ni-63

- Overhaul, and repair of electronic devices such as spark gap irradiators that utilize radioactive Cs-137, Co-60, Kr-85 or UO₂
- Disassembly, inspection and decontamination of aircraft engines that had been exposed to airborne radioactivity from nuclear weapons testing
- Storage and handling of tritium exit signs
- Possible storage of nuclear weapons
- On-site disposal of radioactive materials
- Disposal of radium contaminated liquids via the storm drain system
- Smelting of damaged or used aircraft parts and disposal of slag and waste products
- Screening of used, damaged, obsolete and excess equipment for scrapping or resale

In general, the NAS Alameda HRA, Volume II provides the following information about these radiological operations:

- History of buildings, structures, and outdoor areas impacted by radiological operations
- Potential, likely, or known sources of radioactive material and radioactive contamination
- Previous investigation results
- Contamination migration assessments
- Recommended future actions

4.3 MARSSIM GUIDELINES

This section describes MARSSIM (**ALA-HRA-2**) guidance and how it applies to the former NAS Alameda HRA, Volume II.

4.3.1 Historical Site Assessment

Preparation of this HRA is the first step in following MARSSIM guidelines for evaluating the effects of past radiological operations. The NAS Alameda HRA, Volume II is followed by scoping surveys and, if necessary, site characterization and remedial actions. The final action to demonstrate regulatory compliance for free release of the property is the final status survey (FSS). The FSS report is the final clearance document for a property that is presented to regulators and the public.

Per MARSSIM guidance, this HRA will:

- Identify potential, likely, or known sources of radioactive material and radioactive contamination based on existing or derived information
- Identify sites that need further action, as opposed to those posing no risk to human health or the environment from radiological operations
- Identify potentially contaminated media
- Provide an assessment for the likelihood of contamination migration
- Provide information useful to Scoping and Characterization Surveys
- Provide initial classification of the area or survey unit as ‘impacted’ or ‘non-impacted’

4.3.2 Historical Research

MARSSIM recommends that historical information be collected by:

- Reviewing site evaluations; federal, state, and local investigations; and emergency actions
- Reviewing existing radiological data in licenses, site permits, authorizations, and operating records
- Interviewing previous employees or personnel with knowledge of radiological operations at the site
- Performing site reconnaissance by reviewing maps and blueprints and conducting a physical inspection of facilities
- Using professional judgment

4.3.3 Non-Impacted and Impacted Sites

After review of the information obtained during historical research, MARSSIM recommends assigning a general preliminary area classification of “non-impacted” or “impacted” to all areas at the site.

Non-impacted areas are those with no history of radiological operations, those that have no reasonable potential for residual contamination such as residential and administrative buildings, or shops which performed functions unrelated to radioactivity. Areas with only standard safety devices that contain generally licensed radioactive material, and commercially available, exempt quantity radioactive items such as smoke detectors or exit signs, are classified as non-impacted if the site has no other radiological history. Non-impacted areas are not considered for radiological investigation because there is no reasonable potential for radioactive material to be present. Should information become available that identifies radiological operations associated with a non-impacted area, the area is reclassified as impacted. Discovery of minimal radioactivity attributable to natural background radiation or fallout from weapons testing is not, in itself, cause for designation of an area as impacted. Areas containing machines that produced ionizing radiation (such as x-ray machines) are not classified as impacted based solely on the use of the machines.

Impacted areas are generally those with a history of radiological materials being used, stored, and/or disposed and therefore having the potential for residual radioactive contamination. Examples include locations where leaks or spills are known to have occurred, former burial or disposal sites, areas where radioactive decontamination was performed, or radium paint facilities. Although an impacted site may be remediated and released as free from residual contamination, the site is not generally reclassified as non-impacted.

4.3.4 Potentially Contaminated Media

Once an area is properly classified, the next process involves the identification of potentially contaminated media within the area. While MARSSIM focuses on surface soils and building surfaces, it also provides preliminary guidance on other media types, including:

Surface Media – A term used to describe the top layer of soil, fill, gravel, waste piles, concrete, or asphalt that is available for direct exposure, growing plants, resuspension of particles for inhalation, and mixing from human disturbances.

Subsurface Media – A term used to describe solid materials below the surface medium.

Sediment – Finely divided solid material that settles to the bottom (normally in liquid).

Surface Water – A term used to describe waters from rain run-off, streams, rivers, lakes, coastal tidal waters, and oceans.

Groundwater – A term used to describe the waters contained in subsurface materials and aquifers.

Air – A term used to describe a pathway for resuspension and dispersal of contaminated media in the atmosphere.

Structures – A term used to describe man-made surfaces that are above or below the ground surface, such as buildings and dry docks.

4.3.5 Survey Classifications

MARSSIM classifies survey requirements for impacted areas as Class 1, 2, or 3, depending upon the potential for residual contamination. The classification of a building, structure, or site is a critical step in the survey design process and is used to ensure that areas with higher potential for contamination receive a higher degree of survey effort, with Class 1 areas having the highest potential for contamination.

The criteria used for designating an area as Class 1, 2, or 3 are usually described in the survey or site work plan. As surveys progress and data are analyzed, areas may be reclassified based on newly acquired survey data. For example, if contamination is found in a Class 3 area, it typically is reclassified as Class 1 or Class 2, depending on the results of the survey. These same categories will be applied to any recommended actions listed in Section 8.0. The three classification categories are described in more detail below.

4.3.5.1 Class 1 Areas

An impacted area that is recognized as having a high potential for radioactive contamination, is known to have contamination, or had a prior remediation to remove radioactive contamination is usually designated as a Class 1 area. This would include any area known to contain contamination in excess of release limits based on a Scoping or Characterization Survey. For NAS, examples of Class 1 areas include locations where leaks or spills are known to have occurred; former burial or disposal sites; radium dial paint shops; and areas previously designated as Class 2 or 3 where contamination above the release limits has been found.

Class 1 areas require 100 percent systematic surveys. To conduct these surveys, each area is divided into survey units to facilitate the survey process and analysis of the survey data. The maximum area of a Class 1 survey unit is 100 square meters for floor area of buildings and 2,000 square meters for open land areas. Sizes of the survey units depend on the type and dimensions of the building, structure, or area.

4.3.5.2 Class 2 Areas

An impacted area that is recognized as having a potential for radioactive contamination, but is not expected to exceed the release limit, is usually designated as a Class 2 area. This would include any area known to contain minor isolated areas of contamination with low potential for exposure or buffer zones around Class 1 areas. For NAS, examples of Class 2 areas include locations where radioactive materials were present in an unsealed form and radioluminescent device storage areas.

Class 2 areas require systematic surveys over 10 to 100 percent of the area. The area is divided into survey units to facilitate the survey process and analysis of the survey data. The maximum area of a Class 2 survey unit is 1,000 square meters for floor areas of buildings and 10,000 square meters for open land areas. Sizes of the survey units depend on the type and dimensions of the building, structure, or area.

4.3.5.3 Class 3 Areas

An impacted area that is not expected to contain residual contamination exceeding the release limit is usually designated as a Class 3 area. This could include buffer zones around Class 1 or 2 areas. For NAS, examples of Class 3 areas include laboratory administrative areas, general laboratory supply areas, previously decontaminated and/or surveyed/released areas, scrap or salvage yards, foundries, and smelters or incinerators.

Surveys of Class 3 areas are not standardized and may be conducted randomly. There is no limit to the size of a survey unit. Sizes of the survey units depend on the type and dimensions of the building, structure, or area.

4.4 PREPARATION OF THE FORMER NAS ALAMEDA HRA, VOLUME II

The approach and rationale of the former NAS Alameda HRA, Volume II reviews, field investigations, interviews (see Appendix B), identification of potential radionuclides, and evaluation of previous investigations are discussed below.

4.4.1 Former NAS Alameda HRA, Volume II Approach and Rationale

Preparation of the NAS Alameda HRA, Volume II presented an unusual set of challenges because all naval operations ceased at the site in April 1997. In addition, multiple radiological investigations have been conducted since closure of the NAS. Where an HRA usually lays the groundwork for initiation of radiological investigations, the NAS Alameda HRA, Volume II reviews of historical radiological operations and past radiological investigations provide a complete picture of the current radiological status of the site.

To prepare the HRA, all available historical and current former NAS and Alameda Annex radiological and non-radiological information was evaluated. This research, conducted between January 2005 and February 2006, became the basis for designating sites as non-impacted or impacted and will subsequently be used by the Navy and other Federal, State, and local regulatory agencies to determine future actions for the sites.

Obtaining and evaluating information during preparation of the HRA included:

- Archival research
- Site assessments and reconnaissance
- Interviews
- Site designation
- Radionuclide identification

These activities are discussed in Sections 4.4.2 through 4.4.6.

4.4.2 Archival Research

Navy operations at former NAS were discontinued in 1997. Alameda Annex was closed in 1998. The majority of the personnel working at former NAS were civilian employees;

however, a significant number of active duty military were also employed. Archival research was the primary method used to prepare the NAS Alameda HRA, Volume II because many civilian employees have left the local area and military personnel left with the closing of the base. Every effort was made to find as many records as possible concerning radiological operations at former NAS. Both government and private archives were reviewed.

All archival documents and sources used as references in this HRA are detailed in the listing in Section 10.0. Electronic copies of documents used as references are provided on a compact disc as Appendix C.

4.4.2.1 Archive Locations

Table 4-1 lists archives where information on former NAS was found. Many hundreds of pertinent documents varying in length from 1 to several hundreds of pages and more than 250 maps and drawings were reviewed.

4.4.2.2 Archive Information

Archival information was reviewed to identify potential G-RAM sources, areas of use, radiological controls, regulatory procedures, and releases of radioactive materials at former NAS. Reviews of historical records identified the following principal areas involving radiological operations at former NAS:

Naval Air Station, 1941 -1997: Radiological operations included typical Navy aircraft overhaul and repair functions including removal, repair and installation of radioluminescent devices. In the 1940s through the 1970s, cleaning and painting of radioluminescent components was performed at the Station. This work was performed by the A/R Department from 1941 until 1948, when the A/R Department was redesignated as the O/R Department. In the 1950s, two jet engines, removed from aircraft that participated in atomic bomb testing in Nevada, were decontaminated by the O/R Department at NAS. Disposal areas IR Sites 1 and 2 were in operation from 1943 to 1956 and 1956 to 1978 respectively, during which time essentially all waste generated on the former NAS was disposed of in these locations. As early as 1973, the radioactive wastes generated were being disposed of by licensed radioactive waste disposal firms at approved disposal facilities (ALA-HRA-29, 30).

Naval Air Rework Facility, 1967 -1987: In April 1967 the O/R Department was redesignated as the NARF Alameda. Radiological operations, such as Navy aircraft overhaul and repair functions including removal, repair and installation of radioluminescent devices, primarily Ra-226 and Sr-90, which were previously performed by the O/R Department, were now performed by the NARF. Between 1981 (date first licensed) and 1987, radiological work associated with the gas chromatograph containing a Ni-63 source was performed by the NARF.

Naval Air Depot, 1987 -1996: In April 1987 the NARF Alameda became the NADEP Alameda. Between 1987 and 1996, radiological work previously performed by the NARF associated with the gas chromatograph containing a Ni-63 source was performed by the NADEP.

A radiological history of NAS, NARF and NADEP operations is provided in Section 6.0.

4.4.3 Site Assessments and Reconnaissance

4.4.3.1 Historical Assessments

One base-wide assessment, *Initial Assessment Study, Naval Air Station, Alameda, California* has been performed on former NAS to identify and assess sites posing a potential threat to human health or the environment due to contamination from past hazardous material operations including radioactive materials. This assessment (**ALA-HRA-5**) addresses the entire NAS. A separate facility-wide assessment, *Preliminary Assessment Report, Naval Supply Center, Alameda Annex and Facility, Alameda Ca. 94501*, was conducted of the Naval Supply Center, Alameda Annex and Facility in December 1987 (**ALA-HRA-4**). Detailed radiological surveys and some remediation have been performed to address specific areas and/or buildings on the NAS and on the Annex. The surveys included scans, swipe samples, direct radiation measurements, air, soil, and groundwater and sediment sample analyses. These methods were used to evaluate the radionuclides of concern and associated release limits at the time of the survey.

Assessments were performed primarily by the Navy. A representative of the CDHS observed the surveys of the Hangar 12 DU work area, and performed some confirmation surveys. No other records have been found to indicate that federal, state, or local regulatory agencies have performed radiological assessments on former NAS. Section 6.2 includes a synopsis of each

known radiological assessment, including investigation techniques and findings, from 1941 through 2005. Section 5.0 discusses the types of radioactive materials used at former NAS. A generic description of pathways these materials could have taken to impact human health and the environment is shown in Section 7.0. A comprehensive site-specific summary of this information is provided for each impacted site in Section 8.0.

4.4.3.2 Current Assessments

The following radiological assessments are currently required:

- Navy review of the radiation surveys of Buildings 5 and 400 is needed to determine if the residual radium has been removed as reported in 2001. Similarly, Navy and regulatory agency reviews of the final surveys of Buildings 7, 66-Ignition shop, 310, Bunker 497, and Pier 3 are needed to determine whether further action is required
- Scoping, characterization and/or final status surveys are needed for Building 5 mezzanine, 44, 66 main floor, 113, 114, 309, 346, Bunker 353, Building 400 second and third floors, and the Seaplane Ramp and Parking Apron
- Future assessment activities in the solid waste disposal areas of IR Sites 1 and 2, including the site of the former radioactive waste storage shack, in the western part of former NAS will also include final evaluation of radioactive materials removed in the 1990s
- Assessments are needed of the removal action taken on the storm drain system from Buildings 5/5A and 400 leading to Seaplane Lagoon
- Assessments are needed of the storm drain discharge into Seaplane Lagoon

While the investigative results to date are summarized in Section 6.0, detailed results of these assessments will be documented in individual reports outside the context of the NAS Alameda HRA, Volume II.

4.4.3.3 HRA Site Reconnaissance

As a supplement to archival research, on-site visual inspections of areas with a history of radiological operations were conducted. Through these site visits, current facilities were compared with previous radiological assessments, historical documentation, and maps. The history for each impacted site, with descriptions of the current condition of the site, is provided in Section 8.0.

4.4.4 Interviews

One aspect of the research and investigation is the personal interview. Personal interviews can provide useful information beyond that available in archives about the radiological operations that were performed at the base. Newspaper advertisements were placed in The San Francisco Chronicle, The San Francisco Examiner, The Independent, The Boutique and Villager, The San Mateo Weekly, The Foster City Progress, The Enquirer Bulletin, The Redwood City Tribune, The Oakland Tribune, The Alameda Times Star, The Daily Review, and The TriValley Herald. The ads requested anyone with knowledge of radiological operations on former NAS to call in to a 1-800 phone number. The text of the advertisement is in Appendix B. The ads were run in March 2005. Although, no responses were forthcoming from the advertisements, the NAS Base Historian granted a personal interview, which was conducted at the former NAS.

Based on the historical research, an additional individual (Caretaker Site Manager-former NAS) was identified who could provide information about the radiological operations on former NAS based on personal involvement. An e-mail interview was conducted and information derived from that interview was recorded in Appendix B. A third individual (former environmental engineer) identified in January 2007 was also interviewed by telephone. The information from this interview is included in Appendix B.

4.4.5 Site Designation

Each building, structure, and open space at former NAS has been designated as either radiologically non-impacted or impacted based on information derived from the archive reviews, site reconnaissance, and personal interviews. Impacted areas have been assessed as to the possibility and extent of residual contamination and recommendations of actions to evaluate the extent of potential residual radioactive contamination or radiologically free-release of the property are provided. If a site has been previously radiologically free-released by the Navy and California regulators to current standards, no further action is recommended. Section 8.0 contains recommended actions for each impacted site.

4.4.6 Radionuclide Identification

To properly assess a site, the NAS Alameda HRA, Volume II must determine any radionuclide that was used, who used it, and where it was used at former NAS. Radionuclides that were determined potentially to be at former NAS are Cs-137, Ni-63, plutonium (Pu-239), promethium (Pm-147), Ra-226, Sr-90, thorium (Th-232), H-3, U-235, UO₂ and DU. Additionally, it is possible that some other radionuclides were utilized as check sources for radiation survey instruments and/or vacuum tubes. These include americium (Am-241), carbon (C-14), technetium (Tc-99), Co-60, and Kr-85. See Table 4-2 for summary and detailed information regarding these radionuclides.

Any nuclide that could have decayed through 10 half-lives since its time of use at former NAS is no longer considered a radionuclide of concern. Table 4-3 lists the radionuclides that may potentially still be a concern at former NAS today. Radionuclides used only as instrument check sources are not likely to leak and are not a radionuclide of concern. Two radionuclides associated with nuclear weapons (H-3 and U-235) are listed as radionuclides of concern. The radiation survey performed in Bunker 497 to confirm that these isotopes are not present requires Navy and regulatory agency review prior to release of the bunker.

4.5 HRA BOUNDARIES

4.5.1 Physical Boundaries

In addition to the approximately 2,686 acres that comprise former NAS, the Alameda Annex consisting of approximately 81 acres just to the north and east of former NAS is included in this HRA. Review of the history of operations on former NAS has not indicated that there were any instances of former NAS radiological operations performed outside the boundaries of the NAS. A map of former NAS areas covered by the NAS Alameda HRA, Volume II is provided in Figure 4-1.

4.5.2 Temporal Boundaries

The Navy took title to former NAS in April 1936 and the NAS was commissioned in November 1940. The first identified document to indicate use of radioactive materials is a September 1940 letter from the Twelfth Naval District to the Chief, Bureau of Aeronautics requesting immediate authority to accomplish radium painting at Alameda (**ALA-HRA-31**). It is clear that authority was granted because a November 1941 letter from the Bureau of Aeronautics request information on the age and gender of employees engaged in application of radium (**ALA-HRA-32**). For purposes of the NAS Alameda HRA, Volume II, the temporal HRA boundaries are 1941 through June 2005. The current radiological investigations being conducted at former NAS are briefly discussed in this report; however, final reports of these investigations will be provided in separate site-specific reports.

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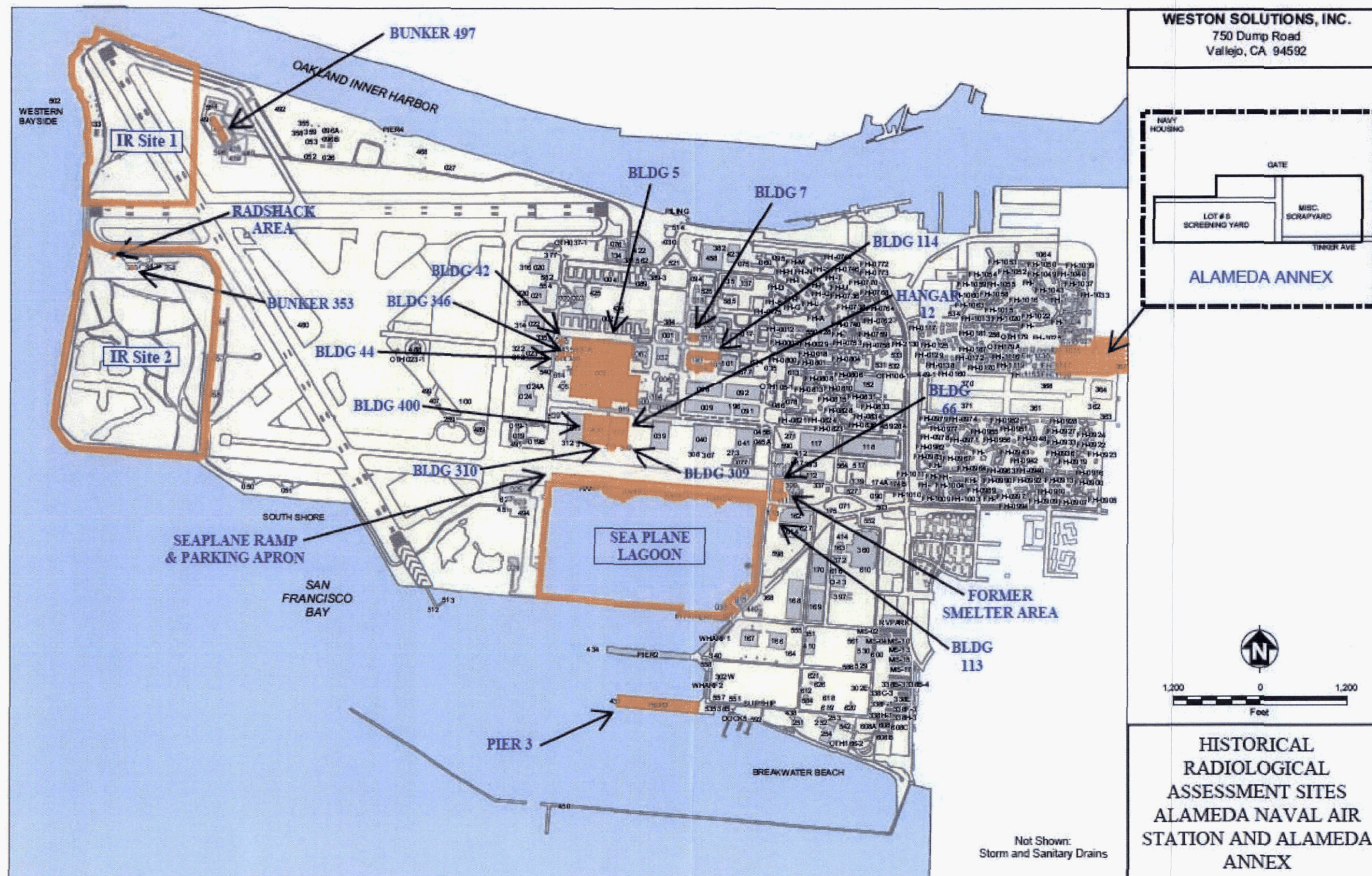


Figure 4-1 Map of Former NAS Alameda and Alameda Annex showing Radiological Assessment Sites

SECTION 4

TABLES

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**TABLE 4-1
ARCHIVE LOCATIONS**

Archive Facility	Location
Former NAS Map Rooms located in Main Administration Building 1-first floor	Alameda, Ca.
Former NAS Technical Library located in Main Administration Building 1-second floor	Alameda, Ca.
National Archives and Records Administration (NARA)	San Bruno, Ca.
National Archives and Records Administration (NARA)	College Park, Md.
Department of Energy/Bechtel Reading Room (on-line electronic files)	Las Vegas, Nevada
Naval Historical Center	Washington D.C.
Naval Sea Systems Command Detachment Radiological Affairs Support Office (RASO)	Yorktown, Virginia

TABLE 4-2
RADIONUCLIDES USED AT FORMER NAS

Radionuclide	Half-life	Radiation	Uses
Am-241 (americium)	432 years	alpha, gamma	check source
C-14 (carbon)	5,730 years	beta	check source
Co-60 (cobalt)	5.27 years	beta, gamma	Associated w/ vacuum tubes and aircraft ignition spark gap irradiator units
Cs-137 (cesium)	30.17 years	beta	Aircraft ignition spark gap irradiator units, check source and/or decontamination products from aircraft engines involved in atomic tests
H-3 (tritium)	12.28 years	beta	Associated w/nuclear weapons. Exit signs
Kr-85 (krypton)	10.72 years	beta, gamma	Gaseous radionuclide; associated w/ vacuum tubes and aircraft ignition spark gap irradiator units
Ni-63 (nickel)	100.1 years	beta	Gas chromatograph
Pm-147 (promethium)	2.62 years	beta, gamma	Wrist watches and compasses
Pu-239 (plutonium)	24,131 years	alpha, gamma	Decontamination products from aircraft engines involved in atomic tests
Ra-226 (radium)	1,600 years	alpha, beta, gamma	Instrument markings and ship deck markers
Sr-90 (strontium)	28.6 years	beta	Ship deck markers, check source and/or decontamination products from aircraft engines involved in atomic tests
Tc-99 (technetium)	213,000 years	beta, gamma	check source
Th-232 (thorium)	1.4×10^4 years	alpha, gamma	Thoriated glass prisms
U-235 (enriched)	7.04×10^8 years	alpha, beta, gamma	Associated w/ nuclear weapons
U-238 (depleted)	4.5×10^9 years	alpha, beta, gamma	Aircraft counterweights
UO ₂ (oxide)	4.5×10^9 years	alpha, beta, gamma	Aircraft ignition spark gap irradiator units

**TABLE 4-3
RADIONUCLIDES OF CONCERN AT FORMER NAS**

Radionuclide	Half-life	Radiation	Uses
Co-60 (cobalt)	5.27 years	beta, gamma	Associated w/ vacuum tubes and aircraft ignition spark gap irradiator units
Cs-137 (cesium)	30.17 years	beta	Aircraft ignition spark gap irradiator units and/or decontamination products from aircraft engines involved in atomic tests
H-3 (tritium)	12.28 years	beta	Associated w/ nuclear weapons, exit signs
Kr-85 (krypton)	10.72 years	beta, gamma	Gaseous radionuclide; associated w/ vacuum tubes and aircraft ignition spark gap irradiator units
Ni-63 (nickel)	100.1 years	beta	Gas chromatograph
Pu-239 (plutonium)	24,131 years	alpha, gamma	Decontamination products from aircraft engines involved in atomic tests
Ra-226 (radium)	1,600 years	alpha, beta, gamma	Instrument markings and ship deck markers
Sr-90 (strontium)	28.6 years	beta	Ship deck markers, check sources and/or decontamination products from aircraft engines involved in atomic tests
Th-232 (thorium)	1.4×10^4 years	alpha, gamma	Thoriated glass prisms
U-235 (enriched)	7.04×10^8 years	alpha, beta, gamma	Associated w/ nuclear weapons
U-238 (depleted)	4.5×10^9 years	alpha, beta, gamma	Aircraft counterweights
UO ₂ (oxide)	4.5×10^9 years	alpha, beta, gamma	Aircraft ignition spark gap irradiator units

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5.0 REGULATORY INVOLVEMENT

This section provides an overview of regulatory agencies involved with the oversight of radioactive materials and their use at former NAS Alameda. Included is the regulatory authority and requirements for the NAS Alameda HRA, Volume II, as well as the involvement of regulatory agencies at former NAS.

5.1 FEDERAL REGULATORY AGENCIES

5.1.1 AEC

The Atomic Energy Act (AEA) of 1 August 1946 established the AEC to develop and manage the atomic energy program following WW II. A civilian government agency, the AEC assumed responsibility for control of radioactive material and its uses from the military's Manhattan Project, the group that developed the atomic bomb during WW II. The AEC's mission included the production and control of fissionable material, accident prevention, research, and peaceful uses of the atom, including the commercial generation of electricity. While the AEC had control of atomic energy production and nuclear materials, facilities using the materials remained under government control. The act provided for a five-member commission, the General Advisory Committee, as well as a Military Liaison Committee within the National Military Establishment, which worked with the AEC on military applications of atomic energy.

In 1953, the DoD established the Committee on Atomic Energy (CAE) to provide assistance and guidance for research and development activities within DoD. The main fields of interest for the CAE were atomic research and its effect on national security, and research and development of atomic energy for military use. During this time, the AEC and DoD also formalized the "Agreement for the Development, Production and Standardization of Atomic Weapons" that established regulations to prevent conflicts of responsibility between the military and the AEC (ALA-HRA-33).

The AEC controlled uses of radioactive materials by issuing "authorizations" or "permits" until 1954, when the AEA was modified. This modification amended AEC controls

and established the licensing program, which allowed for partnerships with private facilities to produce fissionable materials. An additional amendment in 1964 permitted private ownership of nuclear fuels, aiding the growing nuclear power industry.

The AEC was dissolved when the Energy Reorganization Act of 1974 established two new federal agencies to administer and regulate atomic energy activities: the U.S. Energy Research and Development Administration (ERDA) and the NRC. The NRC assumed responsibilities for regulation of the byproduct, source, and special nuclear material previously controlled by the AEC. Military applications of radioactive material remained under the control of ERDA, which was renamed the Department of Energy (DOE) in 1977.

5.1.2 AEC Licensing Controls

With the establishment of AEC licensing controls in 1954, procurement and use of radioactive materials became more stringently controlled. Users were required to submit lengthy “license applications,” with different license types required for byproduct, source, or special nuclear material. AEC required license applications to include:

- Quantity of each radionuclide to be possessed at any one time
- Purposes for which the licensed material was used
- Location where radioactive materials were used
- Qualifications of a Radiation Safety Officer
- Demonstration that facilities were adequate to safely control materials and protect human health
- Administrative and managerial controls
- Monitoring procedures and instrumentation
- Material receipt and accountability procedures
- An occupational radiation safety program for workers
- Standard operating and emergency procedures

- Radioactive waste disposal procedures

5.2 NAVY RADIOACTIVE MATERIALS CONTROLS

5.2.1 General Controls

The first formal document controlling use of radioactive material by the Navy was General Safety Rules Section No. 9, Safe Handling of Radioactive Luminous Compounds of 1942 (**ALA-HRA-34**). However, the Navy did not establish a formal radiological controls program for all types of radioactive material until 1946, shortly after the end of WW II. These controls were the predecessors of the more stringent radiological control programs the Navy has in effect today. The Chief of Naval Operations (CNO) issued the first Radiological Safety Manual for general applications of radioactive material in 1947 (**ALA-HRA-35**). This manual was based on knowledge gained from the bombing of Hiroshima and Nagasaki, and OPERATION CROSSROADS testing of the atomic bomb. As experience with and knowledge of the effects of radiation on ships and naval personnel grew, the Navy worked to establish more protective requirements that met or exceeded Federal regulations.

In the late 1940s and early 1950s, the Navy Bureau of Medicine and Surgery (BUMED) and the Navy Bureau of Ships (BUSHIPS) worked closely with the radiation laboratory (RADLAB) and the Navy Radiological Defense Laboratory (NRDL) at Hunters Point Shipyard (HPS) to develop controls for use of radioactive material throughout the Navy. BUMED established and incorporated safety tolerances into regulations, determined physiological effects and developed treatment methods, and approved specifications for instruments to cover medical uses and exposure to radioactive materials. There was correspondence between NAS and BUMED regarding specifications for the radium paint. BUMED continues to oversee the radiation health protection program in the Navy and Marine Corps today.

BUSHIPS developed and procured instruments to detect radioactivity, equipment to protect personnel onboard ships, and methods and equipment for decontaminating ships. The Naval Sea Systems Command (NAVSEA) assumed these responsibilities when the Navy reorganized. Today, NAVSEA remains responsible for the safety and control of ionizing radiation, including radioactive material, by the Navy and Marine Corps, and provides oversight

and regulatory guidance to the NNPP, Nuclear Weapons Radiological Controls Program, and G-RAM program (known as the Radiological Affairs Support Program [RASP]).

5.2.2 AEC Licensing of Navy Headquarters Commands

In some instances, the Navy's headquarters commands applied to the AEC for authority to use licensed radioactive material. The AEC issued licenses to a single headquarters command even though only an individual field command or ship used the material. In some instances, the licenses authorized use of a radioactive commodity by multiple commands. One such license that may have involved former NAS was AEC Byproduct Material License No. 08-00038-12. This license was issued to the Naval Electronics Systems Command and authorized the use of various check sources in portable and semi-portable survey instruments. The check sources authorized were C-14, Cs-137, Kr-85, Sr-90, and Tc-99. An amendment to the license added Am-241 in 1980. The license states, "Licensed material may be used throughout the United States" (ALA-HRA-36). No specific documentation has been found to indicate that former NAS utilized this license, but because survey instruments were in use in support of fixed and portable x-ray operations, and in support of monitoring personnel and equipment in the radium paint rooms, it is reasonable to expect that some check sources were in use.

5.3 REGULATORY INVOLVEMENT AT FORMER NAS

Former NAS was subject to the AEC licensing requirements for radioactive materials that began in 1954, with additional oversight provided by BUMED and BUSHIPS. The State of California became an Agreement State with the AEC on 1 September 1962, and established the California Agreement State Licensing Program managed by the CDHS. As a Federal entity, former NAS remained under the AEC licensing program. However, it should be noted that use of radioactive material by Navy contractors or former NAS a lessees could have fallen under auspices of the CDHS licensing program. Several contractors have performed work on former NAS under CDHS licenses. The AEC was dissolved in 1974. The NRC took over the function of issuing and regulating radioactive material licenses.

5.3.1 Former NAS NRC License

The NRC issued one specific license for possession and use of radioactive material on former NAS. The license is summarized below and detailed in Table 5-1.

NRC initially issued NRC Materials License 04-19811-01 on July 17, 1981 to the Naval Air Rework Facility (ALA-HRA-37). The license authorized the use of plated sources containing Ni-63 in gas chromatograph analysis equipment. The license was initially issued for use in Building 42 only. NAS constructed a new materials laboratory (Building 7) in 1985. NRC issued Amendment No. 01 to License 04-19811-01 on July 25, 1986 and changed the authorized location of the gas chromatograph equipment to the Building 7 Materials laboratory. License No. 04-19811-01 was converted to a Navy Radioactive Material Permit (NRMP) No. 04-65885-K1NP on 1 April 1987 (ALA-HRA-38).

5.4 NON-LICENSED ACTIVITIES AT FORMER NAS INVOLVING RADIOACTIVE MATERIAL

In addition to the radioactive materials licensed by the AEC or later the NRC, small quantities of radioactive material, below levels requiring licensing, were also used in commodity items throughout the Naval Station. The commodity items included smoke detectors, deck markers, check sources for radiation survey instruments, and one of the principal sources of radioactivity on former NAS, radioluminescent dials and gauges. Use of non-AEC licensed materials sources of ionizing radiation used by the former NAS are described below.

5.4.1 Naturally Occurring Radioactive Material (NORM)

NORM and other radioactive materials not requiring licensing by the AEC or NRC were the principal sources of radioactivity used throughout former NAS in various commodity items. Some examples include smoke detectors containing Am-241 (after 1970), exit signs containing H-3 (after 1970), sound-powered telephone jacks (Ra-226), deck markers (Ra-226 and Sr-90), electron tubes (many different radionuclides), aircraft instruments containing radium dials, knobs, dials and switches (Ra-226), thoriated welding rods and thoriated glass (Th-232), divers' watches (Ra-226, H-3, and Pm-147), and wristwatches and compasses (Ra-226, H-3, and

Pm-147). Formalized controls for most of these items were not found, which is common because these controls were not typically warranted during the early operational time of former NAS. The Navy instruction previously discussed (General Safety Rules Section No. 9, Safe Handling of Radioactive Luminous Compound [ALA-HRA-34]) establishing the controls for application and control of radium paint on aircraft instruments was in effect. Formal controls were established in NAVSUPINST 5101.6 series (ALA-HRA-39) starting in about 1964 under AEC licenses.

Controlled disposal of radioactive commodity items began in the late 1960s when the Navy instituted a program to control devices containing Ra-226 that included removal of radium devices from ships and replacement with non-radium substitutes (ALA-HRA-40). Gradually, the Navy expanded the control program to include all commodity items containing radioactive material. Prior to the implementation of the control programs, former NAS likely disposed of these items as normal trash. In fact, the General Safety Rules Section No. 9 is specific in instructing personnel to dispose of liquid radium wastes generated during instrument cleaning and painting operations by emptying "...directly into the sewage system or deposited in a hole in the earth." Solid material such as the wiping papers used during cleaning of instruments was to be "...permanently disposed of, outside the workroom, by burning or returning to the manufacturer..." (ALA-HRA-34). Disposal of these items in commercial landfills was common practice by private industry as well. For former NAS, IR Sites 1 and 2 were the solid waste disposal areas.

5.5 FEDERAL REGULATORY AUTHORITY AND OVERSIGHT AT FORMER NAS

The following sections discuss the current regulatory agencies that oversee former. Each organization has distinct responsibilities. By agreement, federal agencies do not share jurisdiction over a site.

5.5.1 NRC

The NRC is the federal regulatory authority for use of source, special nuclear and byproduct material as defined in Title 10 of the CFR. Currently the Navy holds a NRC Master

Materials License to cover use of NRC-licensed radioactive material by the Navy and Marine Corps.

The one NRC license specifically issued to former NAS, **04-19811-01** was converted to a Navy Radioactive Material Permit **04-65885-K1NP**. Therefore, the NRC did not review license termination documentation for that license.

5.5.2 EPA

The EPA is a Federal agency that was established in 1970 to protect human health and to safeguard the natural environment (air, water, and land). The EPA is divided into 10 geographic regions; former NAS falls under the jurisdiction of EPA Region IX. Each regional office is responsible for execution of EPA's programs within that region. EPA works closely with other Federal agencies and state and local governments to enforce environmental regulations. While EPA sets environmental regulations, often the responsibilities for oversight activities are delegated to state offices. For former NAS, the EPA oversees the radiological release of outdoor structures and open areas but defaults release of buildings to the CDHS. The EPA is a member of both the BRAC Cleanup Team (BCT) and the Restoration Advisory Board (RAB). EPA regulatory programs at former NAS are discussed below.

5.5.2.1 CERCLA

CERCLA (commonly known as Superfund) was enacted by Congress in 1980 and allows the EPA to:

- Establish prohibitions and requirements for closed and abandoned hazardous waste sites
- Hold the persons responsible for releases of hazardous waste at a site liable for cleanup of the site
- Establish a trust fund to provide for cleanup when a responsible party cannot be identified

The act authorizes two kinds of response actions:

Short-Term Removals, which are prompt responses to address releases or threatened releases.

Long-Term Remedial Responses, which are permanent actions taken to significantly reduce the danger of a release or threat of release of hazardous substances that are serious but not immediately life threatening.

CERCLA also enabled the revision of the NCP to provide guidance and procedures to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. This revision also established the NPL.

5.5.2.2 SARA

SARA amended CERCLA in 1986 and made significant changes to the program. These changes provided new enforcement authorities, including:

- Stressing the importance of permanent remedies and innovative technologies
- Considering other environmental laws and regulations
- Increasing state involvement
- Increasing the focus on human health problems
- Encouraging greater citizen participation in the decision-making process

SARA also required EPA to revise the Hazard Ranking System (HRS) to ensure accurate assessment of sites placed on the NPL. As noted earlier, EPA listed NAS on the NPL in 1999. Alameda Annex is not listed on the NPL.

5.5.2.3 NPL

CERCLA requires that the statutory criteria of the HRS be used to establish a list of national priorities of known or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. The NPL is the result of this requirement. A tool used in the CERCLA process upon completion of the HRS, the NPL is an appendix of the NCP. Identification of a site for the NPL provides notification to the public that the EPA has determined that the site warrants further investigation to assess risks to human health and the environment, and serves as notice to responsible parties that EPA may be seeking remedial

action. Inclusion of a site on the NPL is not a judgment of the activities of the property owner nor does it require action or assign liability. The NPL primarily serves to identify a location where remedial actions appear to be warranted.

5.5.2.4 Major Steps in the CERCLA Process

The CERCLA process has been divided into the following series of steps:

- **Preliminary Assessment (PA):** A screening process to determine if further study is necessary
- **Site Inspection (SI):** An on-site investigation to determine if there has been a release or a potential for a release and to determine any associated threats
- **Remedial Investigation (RI):** A process generally taken by the responsible agency to determine the nature and extent of the problem associated with the release
- **Removal Actions:** An expedited action taken to remove a more immediate environmental threat or health hazard. Removal actions may be time critical removal actions (TCRA) or non-time critical removal actions (NTCRA).
- **Feasibility Study (FS):** Action taken by the lead agency to develop and evaluate options for remedial actions
- **Proposed Plan (PP):** Presentation of the nature and extent of contamination, alternatives evaluated, and preferred approach to remediation
- **Record of Decision (ROD):** A public document that describes the selected cleanup action
- **Remedial Design:** Technical analysis of the site remedy with detailed plans for implementation
- **Remedial Action:** Actual implementation of the cleanup

5.6 DEPARTMENT OF THE NAVY

Because the NAS Alameda HRA, Volume II deals with G-RAM, the Navy's regulatory involvement is addressed below.

5.6.1 Naval Radiation Safety Committee (NRSC)

The NRC has granted the CNO a Master Materials License, which allows the Navy to administer and manage the use of licensed radioactive materials by the Navy and Marine Corps. To manage that license authority, the Navy established the NRSC chaired by CNO N45 (**ALA-HRA-41**). Two technical support centers: the Navy Environmental Health Center, which

manages medical uses of radioactive materials, and RASO, which manages industrial and operational uses, provide support for the NRSC. RASO is the Navy office providing support for radiological issues at former NAS.

5.6.2 RASP

The CNO delegated responsibility for the safe uses of radioactive materials and machines that produce ionizing radiation to the NAVSEA. To implement the responsibilities for G-RAM, NAVSEA established the RASP (**ALA-HRA-42**). RASO provides technical support to NAVSEA for administration and management of the RASP. While this has been the organization since 1984, the RASP and RASO were established in 1972. RASO has made technical assistance visits approximately every 3 years since 1973 (**ALA-HRA-29, 30, 43, 44, 45, 46, 47, 48, 49**). During these visits, radiological operations, including procedures, have been routinely reviewed.

5.6.3 IR Program

The Navy established the IR Program to implement the requirements of the Defense Environmental Restoration Program (DERP) and CERCLA. The purpose of the IR Program is to identify, investigate, and clean up or control releases of hazardous substances and to reduce the risk to human health and the environment from past waste disposal operations and hazardous materials spills on Navy and Marine Corps property in a cost-effective manner. The Naval Facilities Engineering Command (NAVFAC) manages the IR Program. RASO provides technical expertise to NAVFAC for G-RAM issues associated with IR sites.

The IR Program manages Navy property closed under the BRAC Program. The specific manager for former NAS is the BRAC Project Management Office West (BPMOW), which works with the EPA, as well as state and local agencies, and the public, to ensure all actions taken at former NAS comply with CERCLA. The BPMOW uses a BCT that comprises representatives from all regulatory agencies to review ongoing and proposed actions at former NAS on a monthly basis. Additionally, representatives from regulatory agencies, the local community, special interest groups, and the Navy comprise a RAB. The RAB conducts monthly

meetings to exchange information on environmental cleanup issues. RAB meetings are open to the public.

5.7 STATE OF CALIFORNIA

The State of California works with EPA and Southwest Division, Naval Facilities Engineering Command (SWDIV) to ensure all aspects of CERCLA are implemented at former NAS. The primary state agencies involved with former NAS are detailed below.

5.7.1 CDHS

CDHS is the recognized authority on public health and a technical leader in scientific investigation. This department also implements the California Agreement State Radioactive Material Licensing Program. The Navy will seek CDHS concurrence for any radiological free release of property subject to this report.

5.7.2 Department of Toxic Substances Control (DTSC)

As a department of the California Environmental Protection Agency, the DTSC mission is to protect Californians from exposure to hazardous wastes. DTSC is a member of the BCT and RAB.

5.7.3 San Francisco Bay Water Board

The San Francisco Bay Water Board (Water Board) is a regional office of the California State Water Resources Control Board. The Water Board develops and enforces water quality objectives and protects the beneficial uses of the state's waters. The Water Board oversees the Petroleum Program and groundwater issues at former NAS and is a member of the BCT and RAB.

5.8 CITY AND COUNTY OF ALAMEDA

The City and County of Alameda take an active role in the ongoing development and reuse of former NAS. The City of Alameda is the prospective transferee of former NAS from

the Navy, provides representation on the BCT and RAB, and reviews all radiological actions at former NAS.

5.9 LOCAL COMMUNITY

The local community provides input on former NAS environmental cleanup activities via the Alameda Reuse and Redevelopment Authority (ARRA), the RAB, and the Citizens Reuse Committee (CRC). The Navy maintains a former NAS mailing list of over 400 names including residents of Alameda, businesses on Alameda Point, elected officials, community groups, media contacts and surrounding community members.

5.10 CURRENT CONTRACTORS

While the Navy has an NRC Master Materials License that would cover the residual radioactive material at the site, it is Navy policy that the contractor actually performing the work must maintain independent license authority.

Contractors performing current radiological work at former NAS involving licensable quantities of radioactive material must have an NRC or a California Agreement State license for remediation, packaging, and transportation of any resultant waste.

All contractors performing radiological work at former NAS prepare site work plans delineating proposed work efforts and safety measures. RASO and the appropriate regulatory agencies review the work plans prior to initiation of work efforts. RASO also provides oversight during the work process and reviews all subsequent reports.

SECTION 5

TABLES

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TABLE 5-1
NUCLEAR REGULATORY COMMISSION MATERIALS LICENSE AND NAVY RADIOACTIVE MATERIAL PERMITS
(NRMP)
ISSUED TO FORMER NAS

License/NRMP No., Amend.	Issued to	Date	Authorized Isotopes	Comments
NRC License 04-19811-01 Initial Issue	Naval Air Rework Facility, NAS	7/17/1981	Ni-63 not to exceed 15 millicuries per source	For use in gas chromatograph for sample analysis. Licensed material to be used only at Building 42.
NRC License 04-19811-01 Amend. 01	Naval Air Rework Facility, NAS	7/25/1986	Ni-63 not to exceed 15 millicuries per source	For use in gas chromatograph for sample analysis. Licensed material may be used at Materials Lab, Building 7.
NRMP 04-65885-K1NP Initial Issue	Naval Aviation Depot, NAS	4/01/1987	Same as NRC License 04-19811-01	NRMP replaced NRC License. A Ni-63 source was lost in 1989 and replaced.
NRMP 04-65885-K2NP Initial Issue	Naval Aviation Depot, NAS	2/04/1992	Ni-63 15 millicuries each	For use in gas chromatographs for sample analysis. This new NRMP replaces NRMP 04-65885-K1NP, which was allowed to expire before it was renewed.
NRMP 04-65885-K2NP Amend. No. 1	Naval Aviation Depot, NAS	7/17/1995	A. Ni-63 not to exceed 15 millicuries per source. B. Ni-63 not to exceed 10 millicuries per source.	For use in gas chromatographs for sample analysis. This amendment adds authorization for a second gas chromatograph.
NRMP 04-65885-K2NP Amend. No. 2	Naval Aviation Depot, NAS	9/18/1996	None	Terminated the NRMP for Naval Aviation Depot. (See below for transfer of function to Naval Air Station). One of the two gas chromatographs was returned to the manufacturer.
NRMP 04-00236-K1NP Amend. No. 0	Naval Air Station, Alameda	8/09/1996	Ni-63 not to exceed 10 millicuries per source.	New NRMP issued to Naval Air Station to permit continuity of analysis operations as the Naval Aviation Depot was closed.
NRMP 04-00236-K1NP Amend. No. 1	Naval Air Station, Alameda	6/19/1997	None	NRMP terminated.

NAS – Naval Air Station, NRC- Nuclear Regulatory Commission, NRMP- Navy Radioactive Material Permit, Ni - nickel

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6.0 HISTORY

This section presents a historical overview of NAS as it relates to the use of G-RAM. The history is augmented by the specific building use and area details in Section 8.0. The main source of radioactive contamination on NAS was the radium instrument cleaning and painting operations conducted in Building 5 and later in Building 400. These operations resulted in the contamination of buildings 5 and 400, the storm drains from both buildings, leading to contamination in the northwest outfall of Seaplane Lagoon, and disposal areas IR Sites 1 and 2.

Several other sources of radioactivity such as DU, and various electronics containing sealed sources have also been identified. The following sections discuss each operation involving sources of radioactivity as well as the buildings and sites impacted by those operations. A brief history of the development of former NAS is followed by discussion of each operation identified. A brief summary of the radiation surveys performed at various sites on NAS and of any remediation performed follows the description of the radiological operations. These actions include those completed through June 2005. Actions taken after June 2005 will be documented in separate reports.

Use of Alameda facilities for nuclear-powered Navy vessels has been described in Volume I of the HRA (ALA-HRA-1).

6.1 ALAMEDA NAVAL AIR STATION

The original site of the naval air station consisted of three parcels of land totaling 2,004 acres obtained from the City of Alameda. The City of Alameda donated two of these parcels consisting of approximately 1,075 acres of land and water to the Government in 1930 for the development of Benton Field for an Army Air Field. In 1936, the City of Alameda deeded the third parcel containing approximately 929 acres of land and water at the west end of the naval station to the Government at a nominal cost of one dollar. It included the site of the former Alameda Airport, which was used by Pan American Airlines as their west coast terminal for transpacific flights. The entire original site included only approximately 300 acres of dry land; the remainder of the site was under water. The original construction plans, as authorized,

provided for the reclamation of approximately 880 acres including the 300 acres. Subsequent acquisitions of adjacent property and airspace easements have increased the area to approximately 2,686 acres (**ALA-HRA-3**). See Appendix A for historical photographs and maps that show the development of Alameda Point and of the Naval Air Station.

Before the Navy acquired the property that was to be NAS, there were two commercial airports on Alameda. The Alameda Airport (Figure 6-1) was in operation as early as 1927 at the tip of the island and consisted of a single east-west runway, three hangars, an administration building, and a yacht harbor. Just a few miles to the east, the San Francisco Bay Airdrome (SFBA) (Figure 6-2) started construction in 1929.

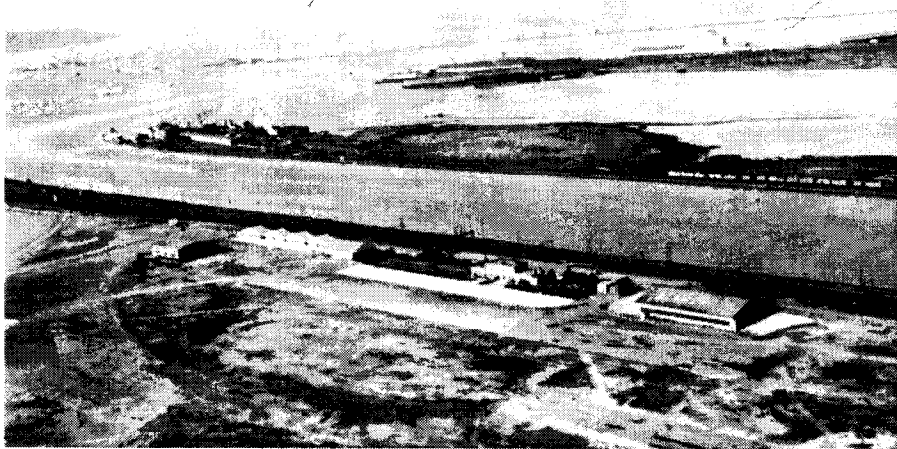


Figure 6-1 Alameda Airport 1937

The Army acquired the property from the City of Alameda and renamed the site Benton Field. Pan American Airlines took over the yacht basin in 1935 and started seaplane service to Hawaii and the Far East. In 1936 when the Navy obtained the property, the Army turned over its facilities at Benton Field to the Navy. Congress appropriated \$10 million for the development of a Naval Air Station at the site in 1938. Pan American moved their operation to Treasure Island in 1939 and the Naval Air Station was commissioned the following year.

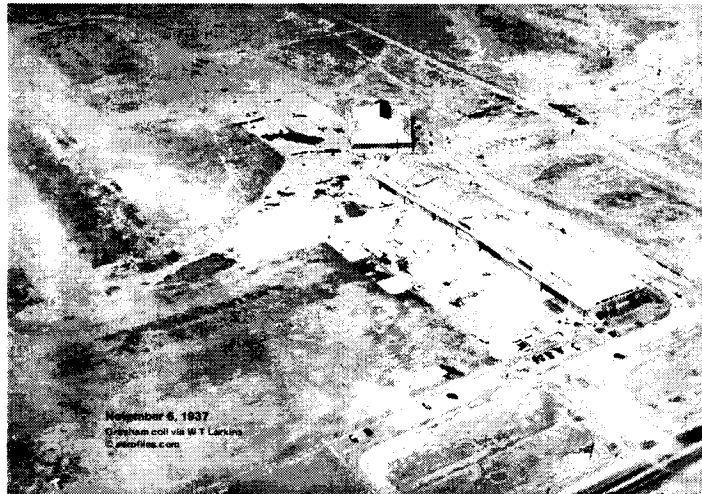


Figure 6-2 San Francisco Bay Aerodrome 1937

The SFBA initially had two runways and a single 53,000-square foot hangar. By 1936, the SFBA had four runways, a blimp anchorage, and five hangars including one positioned at an angle to the others and that later became the site of Building 365 in the Alameda Annex DRMO facility. Both commercial airports were closed by 1941 to make way for the Naval Air Station (Figure 6-3).

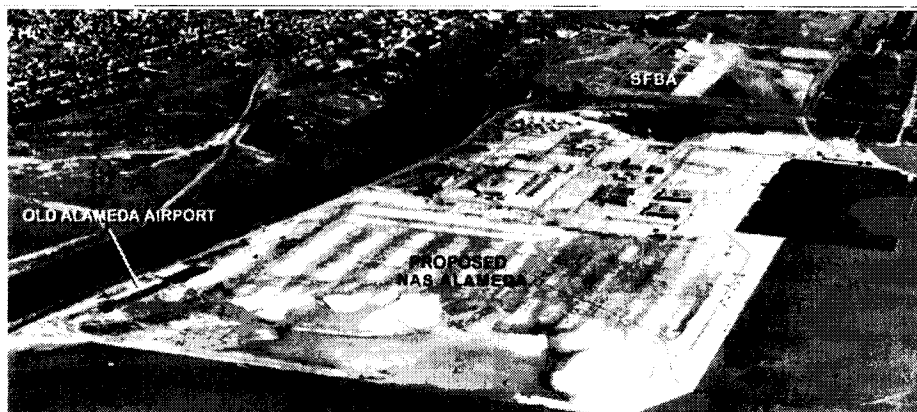


Figure 6-3 Old Alameda Airport, San Francisco Bay Aerodrome, and Proposed NAS Alameda 1940

The original plans for the NAS called for a 1,000-man station, with construction beginning in 1938. The construction projects included dredge fill operations; installation of services; and construction of an administration building, eight wings of barracks, a mess hall,

theater and welfare building, public works garage and fire house, assembly and repair shop, power plant, storehouses, engine test stands, two seaplane hangars, four land plane hangars, operations headquarters, officers quarters, lagoon and a seaplane ramp (ALA-HRA-11).

In 1940, the war in Europe escalated. The Navy subsequently changed plans for the naval air station from a 1,000-man station to a 4,000-man station. Shortly after the air station was commissioned; the A/R department employed 175 personnel in Building 5. NAS completed overhaul of their first aircraft in May of 1941 (Figure 6-4).

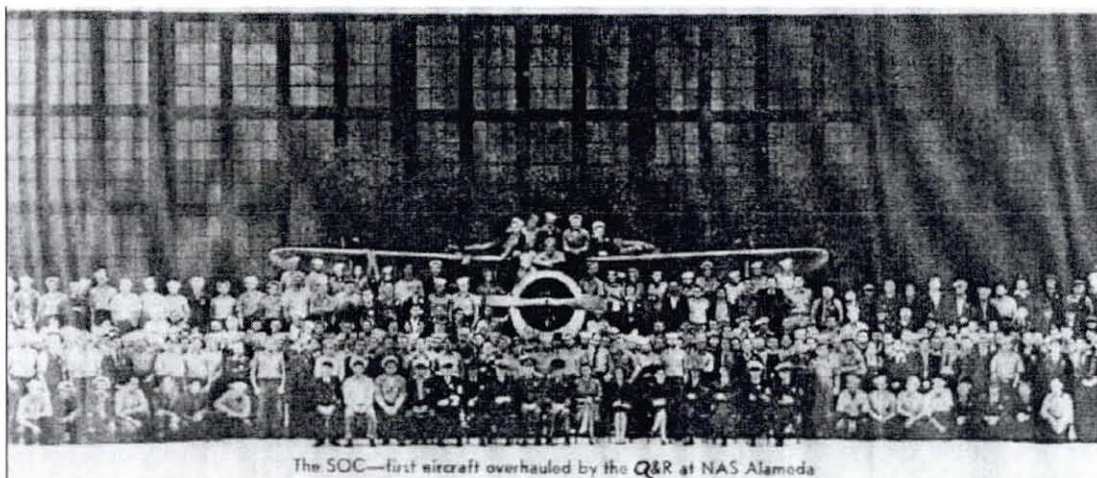


Figure 6-4 The first airplane overhauled at NAS Alameda 1941

By December 1941, the A/R employed approximately 1,800 personnel who overhauled 14 aircraft per month. By 1945, there were 158 buildings on NAS. After the war ended, NAS continued to grow and expand. For example, the turbo-jet overhaul gradually increased to the point where the existing facilities in Building 5 were inadequate. In March 1948, the jet overhaul operations expanded to Buildings 66 and 113 (ALA-HRA-50). In 1958, the A/R employed approximately 5,700 personnel and occupied 43 buildings with well over 2,000,000 square feet of floor space on the Naval Air Station. In 1967, the O/R department became a separate command known as NARF, Alameda. The NAS closed in April 1997.

The Alameda Annex and Facility is located adjacent to and east of NAS. The Alameda Annex and Facility property is approximately 143 acres and is bounded on the north by the Oakland Inner Harbor; on the east and south by the City of Alameda; and on the south and west

by NAS. The Navy obtained the south part of the area in 1951 and the north part in 1966. The property was used as the main supply center supporting the operation of military fleets and shore activities in the Pacific Basin. The Alameda Annex portion of the property is approximately 81 acres, which includes the DRMO screening yard and three buildings (Buildings 365, 366, and 367). The Alameda Facility portion is approximately 62 acres. One of the buildings on the Annex, Building 365, was built in 1931 and was one of the original hangars on the SFBA. The Navy constructed the majority of the buildings in 1953 as general warehouse and bulk storage areas. In 1993, the Alameda Annex was designated for closure under the 1990 BRAC Act. The Alameda Annex was formally closed in September 1998 (ALA-HRA-51).

6.1.1 Refurbishment and Handling of Radioluminescent Devices

6.1.1.1 Building 5

Beginning in the late 1930s and continuing through the war years, radioluminescent devices and paint came into wide use by the Navy. Dials and surfaces that needed to be illuminated were coated with a radioluminescent compound or paint, containing Ra-226 mixed with a base (ALA-HRA-34). This mixture would “scintillate” or glow when the base and Ra-226 (and its ionizing radiation) were mixed together. This radioluminescence allowed personnel to locate controls, gauges, and walkways during “darken ship” operations in aircraft or on dry docks or piers without the use of an external power source. Use of radioluminescent devices was common on Navy aircraft. These devices constituted the first known G-RAM introduced to former NAS.

The first radium paint shop on former NAS was located in the mezzanine area of Building 5, the A/R department. Building 5 is also known as Installation Restoration Site 5. It was constructed in 1940 and was the first building used by the A/R Department for the application and repair of radioluminescent paints on aircraft components. Building 5 is a very large structure of over 900,000 square feet used for the overhaul and repair of various Navy aircraft. The mezzanine area of the building runs east and west in the center of the building and the first radium paint shop was located in the center section of the mezzanine as early as 1941 (Figure 6-5). The earliest mention of radium painting operations was in 1941 when the NAS

responded to an information request from the Navy Bureau of Aeronautics (BUAERO) (ALA-HRA-32) and reported that there were two male employees performing the application of radium paint (ALA-HRA-52).

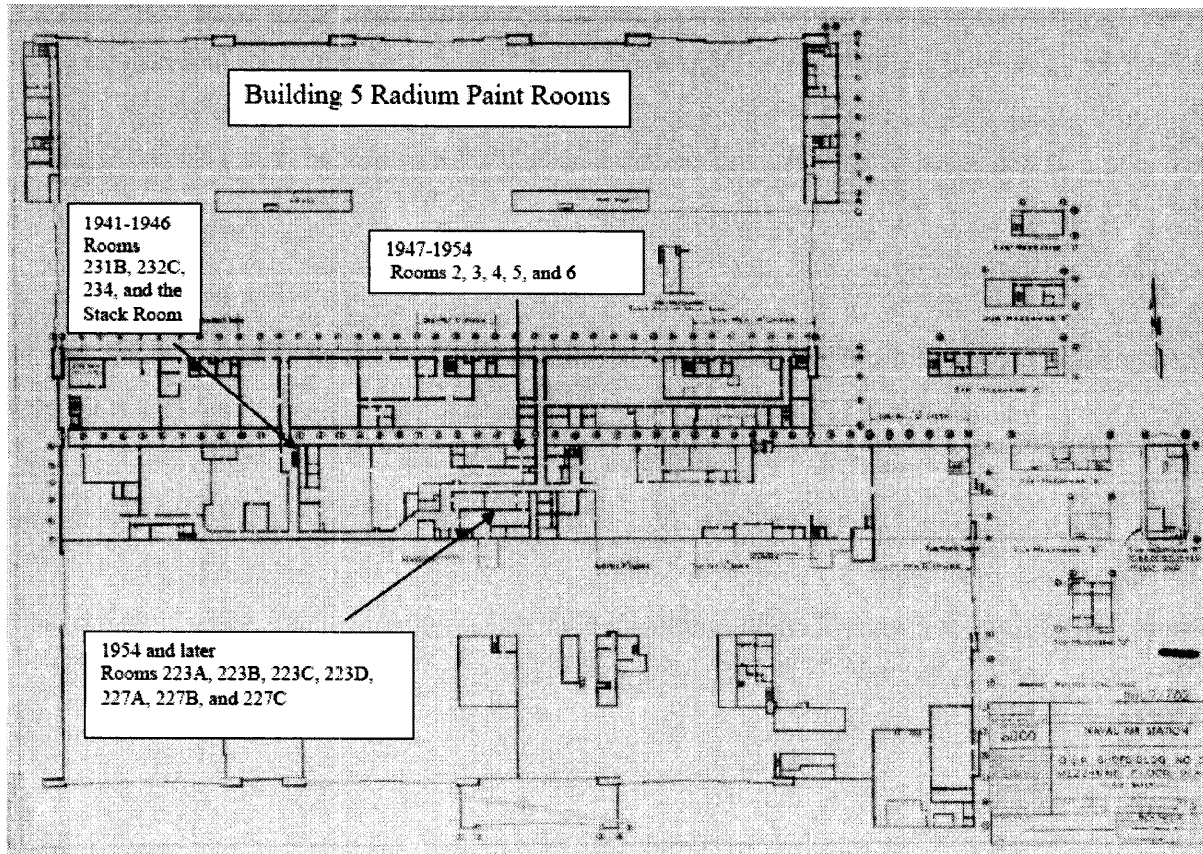


Figure 6-5 Historical Radium Rooms in Building 5

Other than location, no details of this first radium paint shop have been found. There was early correspondence requesting radiation monitoring equipment to support the radium paint shop activities. A November 1942 letter from the NAS noted that an earlier request for a suitable instrument had been cancelled by BUAERO in order to wait for an improved type of instrument (ALA-HRA-53). A radiation detector was finally shipped in December 1942 (ALA-HRA-54). Correspondence between BUAERO and NAS in 1943 discusses the quantity of radioactive luminous material required on a routine basis (ALA-HRA-55).

In early 1944, NAS submitted a request for funds to make several modifications to the A/R Building (Building 5). One of the proposed modifications was enlarging and rearranging the instrument shop where the radium paint facility was located (ALA-HRA-56). In 1945, the A/R Department issued a request for information regarding new tools or methods to improve the application of the radium paint. The request also asked for any information concerning application of the radium paint by silkscreen methods (ALA-HRA-57). A 1946 drawing (Figure 6-6) showing the planned alterations to the instrument shop radium paint room reveals that the original (pre-November 1946) radium paint room was located in the west end of the mezzanine center section of Building 5. The alterations included moving the radium paint room to the east end of the center section of the mezzanine (ALA-HRA-58).

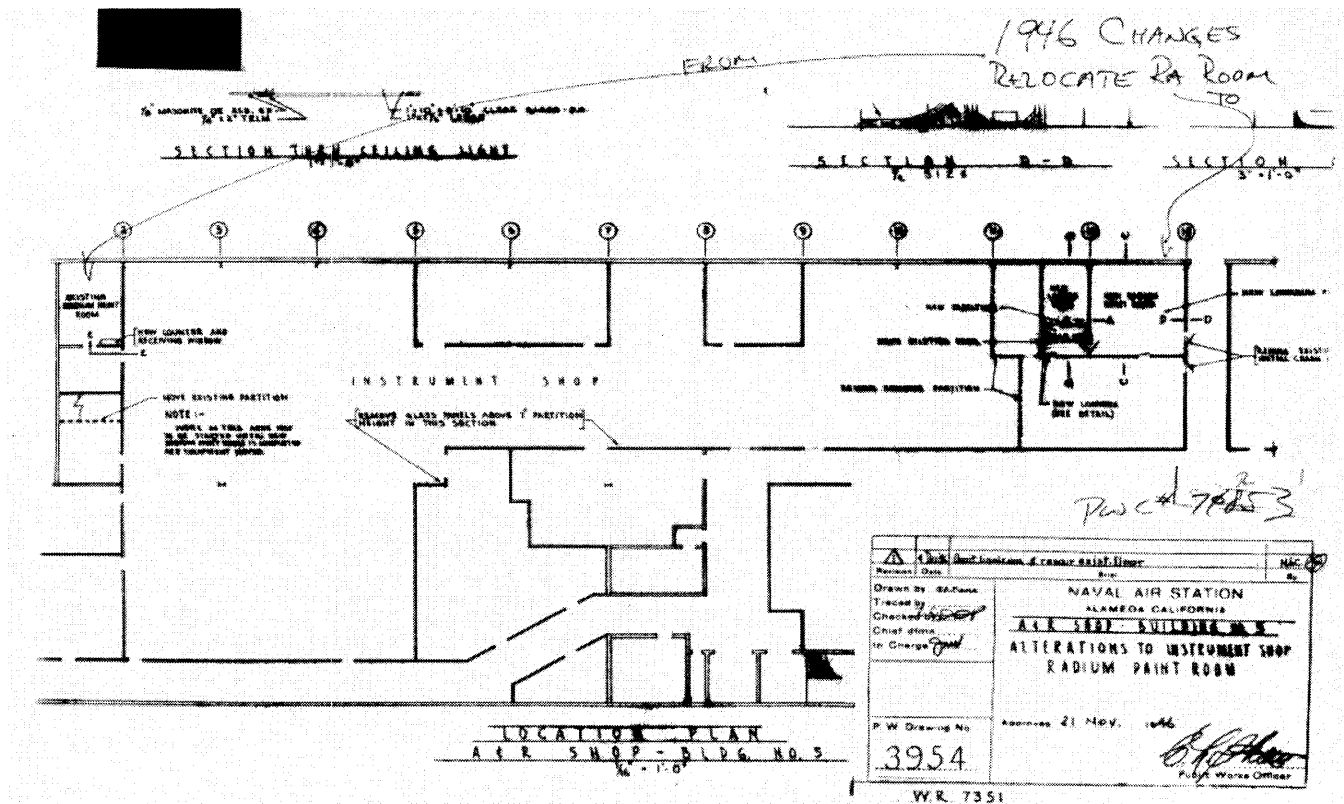


Figure 6-6 Relocation of Radium Paint Room 1946

A 2001 survey report identifies the original radium paint rooms as rooms 231B, 232C, 234, and the stack room (**ALA-HRA-59**). There is no indication on the drawing that the area

once occupied by the radium paint room was decontaminated as part of the move to a new location. A quarterly summary of the Naval Air Station reports in mid -1947 that a “completely new room for instrument dial refurbishing was constructed for the application of radioactive materials, and its use was inaugurated 27 February 1947.” The report continues, “In this room all safety regulations are complied with and every possible precautionary measure has been taken to insure the safety of personnel” (ALA-HRA-60). The Medical Department reported in 1948 that the Radium Dial Painting Shop “... has been completely revamped with new, modern equipment being installed. The industrial hygienist participated in the drawing up of plans for the shop and many control features were incorporated at his suggestion. The radioactivity hazard was under constant control and repeated tests on the employees and the shop areas showed that at no previous time were safety measures as well controlled as they are now. At no time during the year did we have a breath radon test or workroom air sample show in excess of allowable limits. A survey at the end of the year demonstrated, however, that further studies of the radioactivity hazard are necessary to determine quantitative (sic) exposure dosages” (ALA-HRA-50). It is probable that the 1948 Medical Department report refers to the same modification to the radium paint facility as the NAS history report 1947. Former NAS requested additional modifications to the radium paint facility in August 1949 (ALA-HRA-61). Further modifications requested in 1950 were approved by BUAERO in August 1950 (ALA-HRA-62).

The earliest Navy requirements for control of radium painting operations were dated 1942 and included specific requirements for general area forced ventilation to maintain the radon content in the room below specified control levels. In addition, the actual weighing, compounding and bottling of the radium compound were to be accomplished under a hood with suction ventilation. Each worktable was to be provided with individual mechanical exhaust ventilation (ALA-HRA-34). In 1949, the Medical Department established a photodosimetry program to monitor the radiation exposure of personnel on former NAS (ALA-HRA-63).

The raw materials for use in the radium paint shop caused some concern as well. In an April 1948 letter, the Commanding Officer discusses two reports of unsatisfactory and defective materials issued the previous year. The reports themselves are not available but the NAS letter indicates that the luminescent fluorescent-radioactive material was unsatisfactory and did not

comply with the Navy specifications. The letter goes on to say that, the vendor, Canadian Radium and Uranium Corporation, had replaced the defective material and the new material was satisfactory. The letter also recommends that the Chief of BUAERO amend the procurement specification to require a change in the size and shape of the vials of thinners and adhesives to improve stability (**ALA-HRA-64**). BUAERO approved the recommendation from the former NAS and did propose changes to the procurement specification (**ALA-HRA-65**). The military considered replacing radium with some other material and announced a meeting to be held to discuss the military characteristics for a radioactive substitute for radium in self-luminous markings (**ALA-HRA-66**). In July 1949, former NAS issued another report of unsatisfactory or defective material. Shipments of fluorescent radioactive-luminescent material from the Canadian Radium and Uranium Corporation were unsatisfactory due to extreme leakage of the containers of thinner in the cardboard cartons. The report states that the solvent concentrations were sufficient to cause a health hazard. The packages of material were not shielded and the on-contact radiation levels were well in excess of the Interstate Commerce Commission criteria for shipping of radioactive materials. Radioactive material in the form of fine dust was found on the outsides of the bottles and the inside of the cartons (**ALA-HRA-67**). There is no information identifying the location of the receiving area or the storage area for the radioactive material.

An article in the station newspaper discusses the hazards associated with working in the instrument repair shop. The workers took turns in working in the radium room for 3-day periods. They were instructed to wear smocks, head coverings and gloves, and were to work behind a glass shield. The workers were required to wear a dosimetry device (unexposed x-ray film) as part of the photodosimetry program mentioned earlier. The film was processed after use to measure the radiation exposure received by the worker. The article notes that the volume of work had decreased significantly since 1949 because the use of radium was limited to bank and turn indicators whereas prior to 1949 radium was used on all navigation instruments (**ALA-HRA-68**). A naval message from BUAERO in February 1950 directed radium paint facilities to cease immediately use of radium on all instruments except inclinometers and inclinometers contained in turn and bank indicators (**ALA-HRA-69**).

The NRDL reviewed the controls being applied for the radium paint shop and determined that although the controls met the requirements of the National Bureau of Standards Handbook, the more restrictive requirements of the AEC standards were not being met. The instrument shop was decontaminated and new control measurements were implemented. NRDL reported the results in a 1952 Nucleonics magazine article, which noted that contamination, particularly airborne, was significantly reduced to below the AEC standards in most cases (ALA-HRA-70). NAS established a task force to survey the on-going problem of alpha contamination in the instrument shop in 1952 (ALA-HRA-71). No documentation was found detailing the results of the investigation.

In July 1953, former NAS submitted a request for funds to consolidate and control the disassembly of radium painted instruments with the repainting of those instruments still requiring the use of radium paint. The submittal noted that controlled methods were applied in the disassembly, stripping, and painting of instruments. However, the disassembly of the instruments posed a health hazard due to resulting dispersal of paint particles (ALA-HRA-72). In 1954, NAS moved the radium paint shop portion of the instrument shop to a third location in the middle section of the mezzanine (Figures 6-7 and 6-8). There were no documented reports of violations of radium instrument repair operations. Over the course of approximately 13 years, the radium paint facility occupied three separate sets of rooms in the mezzanine floor of Building 5 as shown in Figure 6-5.

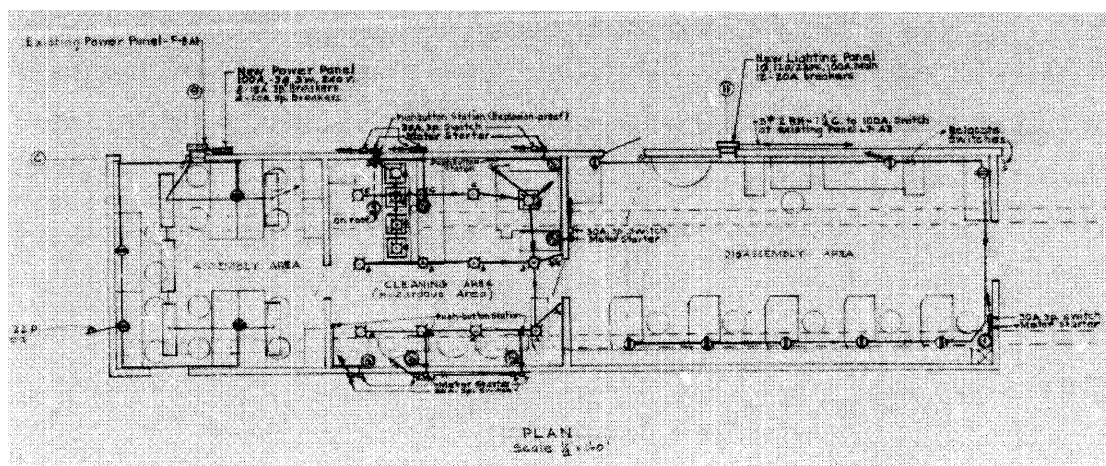


Figure 6-7 Location of new radium paint shop in 1954.

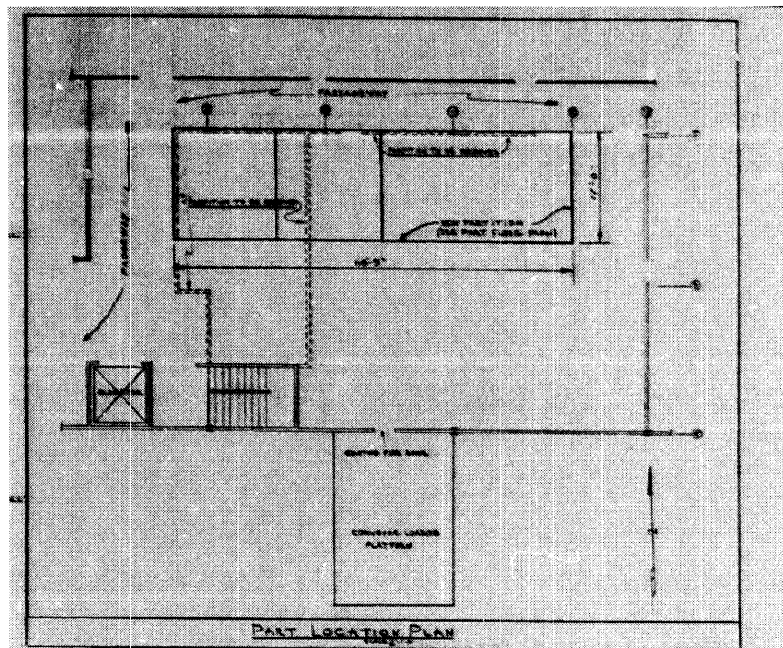


Figure 6-8 Additional details of the 1954 relocation of the radium paint shop.

Based on the historical information reviewed, Navy considers that all three former locations of the radium paint facility are potentially impacted.

6.1.1.2 Building 400

The radium paint shop facilities were moved from Building 5 to Building 400 in the late 1950s. The exact date of the move of the radium paint facilities from Building 5 to Building 400 is not known. Documents confirming the use of radium paint in Building 400 were evident in the early 1970s. The first RASO Technical Assistance visit to NAS in 1973 reported that items suspected of containing radium were sent to special rooms in Building 400 to be surveyed. Radiation detection instruments were available to detect alpha radiation and beta-gamma radiation. There was a stationary system with an alarm set up for counting beta-gamma swipes. If items monitored were considered unsafe, they were disposed of as radioactive waste. Those items disposed of were sent to a fenced-in area (RadShack Area) for storage until collected by a radioactive waste disposal firm (ALA-HRA-29). The 1977 RASO Technical Assistance visit described aircraft instrument preprocessing, "...pre-processing is performed in Building No. 400 at shop 94111. Preprocessing includes the identification, removal, packaging, and disposal of

component parts which contain radium-226 and its daughter products in luminescent markings” (ALA-HRA-30). Incoming instruments suspected of containing radioluminescent material were screened with a Geiger-Mueller detection system. Instruments were disassembled, and the radioactive parts were removed and replaced with non-radioactive parts. The 1977 Technical Assistance visit report goes on to say that, control of environmental contamination by radioactive material was not established or practiced. Even though that observation was made, a contamination survey taken at the time did not indicate the presence of loose alpha contamination. The April 1979 RASO Technical Assistance visit report noted that the identification, removal, packaging, and transfer of radioluminescent dials and gauges took place in the pre-processing room (203) and the stripping room (204). NAS performed instrument disassembly in room 204 in an area controlled by a rope barrier. During this 1979 visit, a RASO survey detected loose alpha contamination above limits on a wooden footrest, in a tool chest drawer, and in a sink drain. This report also commented that, “The amount of radium discharged into the sewer system from the deep sink and released through the exhaust of the fume hood had not been determined” (ALA-HRA-43). In July 1980, another RASO Technical Assistance visit noted that radium instrument processing was not being performed pending completion of a new facility. The report also noted that the previous facility had been decontaminated (ALA-HRA-44). Two additional RASO Technical Assistance visits in late 1983 and in 1985 noted that radium removal operations were performed under a fume hood, and that unlabeled radioactive waste and unlabeled materials containing radium were stored in the radium removal room (ALA-HRA-45, 46).

In 1996, in preparation for base closure, NAS published cleanup reports for each building on the station. The cleanup report was to address all sources of potential contamination such as asbestos, polychlorinated biphenyls (PCBs), lead, radioactive materials, etc. The cleanup report for Building 400 contains a sketch (Figure 6-9) of the second floor of the building showing five rooms, rooms 203, 204 (with a small unnumbered room inside of 204), room 210 (graphic arts), 213 (silk screening room), and room 211/214 (restrooms), as potentially contaminated due to radium work. In addition, the small unnumbered room inside of room 204 is identified as a DU storage room (ALA-HRA-73).

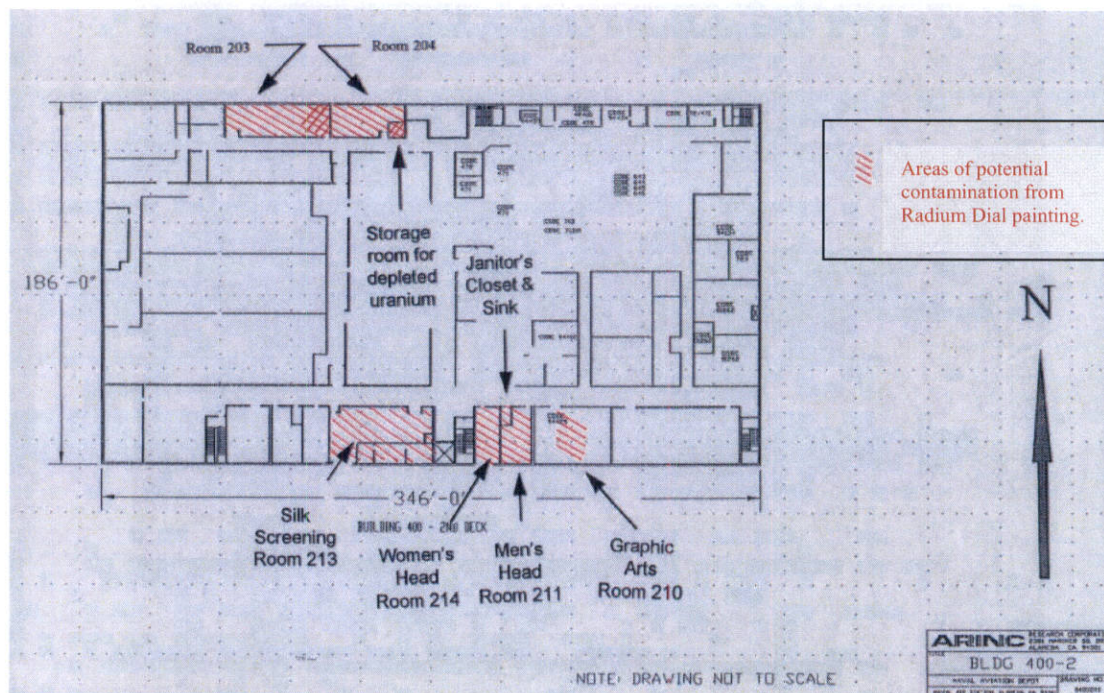


Figure 6-9 Potentially contaminated rooms in Building 400

Several surveys and removal actions have been conducted in Building 400 since base closure. These are reviewed in Section 6.2.7.

Radium waste was disposed of in the storm drain system leading from Buildings 5 and 400 and into the Seaplane Lagoon. The 1979 RASO Technical Assistance visit report questioned the quantity of radium discharged from the deep sink. Radium waste was also disposed of in IR Site 1, 1943-1956 Disposal Area, and into IR Site 2, West Beach Landfill, which operated from 1952 to 1978. NAS used IR Site 1 at the northwest end of Alameda point as an industrial and non-industrial waste disposal area from the early 1940s until 1956. Early photographs of IR Site 1 location show that the area was underwater until dredging and filling reclaimed the area. Later photographs show the existence of at least six disposal areas (Figure 6-10).



Figure 6-10 IR Site 1 1947

IR Site 1 includes a former rifle range, several buildings, a jogging trail, and portions of two runways. During the time the disposal area was in use, it is likely that all waste generated on the naval air station, both household and industrial, was disposed of there. Radioactive wastes were clearly disposed of in IR Site 1. The early Navy direction for disposal of radium waste from the radium paint facility is clear in directing that liquid wastes be "...emptied directly into the sewage system or deposited in a hole in the earth." Dry waste such as wiping papers used to wipe up excess solvent was to be "...permanently disposed of outside the workrooms, by

burning or returning to the manufacturer of radioactive luminous compound for reclaiming the radium” (ALA-HRA-34). The above noted direction does not address what to do with radium components such as dials, gauges, and the like that are damaged or otherwise not usable. However, because the radioactive liquids were to be disposed in the “sewage systems” or by burial, and the wiping papers were to be disposed of by burning or return to the vendor, it is likely that damaged or unusable components were also disposed of by burial or returned to the vendor. In addition to the general direction to dispose of radium waste, which was spelled out in the 1942 Navy instructions, a specific instance of a disposal of radium waste was documented by the Naval Energy and Environmental Support Activity (NEESA) IAS, prepared in 1983. The IAS reports that a contractor was hired to decontaminate the radioluminescent painting facilities in Building 5 after their closure in the late 1950s/early 1960s. A number of metal and wooden workbenches were buried in IR Site 1 just north of the rifle range, approximately 50 ft north of an above ground water outlet, in an unlined trench 50 feet long, 8 feet deep and 11 feet wide. The radioactive material was from the radium paint shop in Building 5 and was disposed of by burial because a contractor hired to decontaminate the radium paint facility was unable to decontaminate them. It was also reported that dial stripping sludge might have also been buried there (ALA HRA-5).

6.1.1.3 Radium and other Radioactive Waste

A smelter was located adjacent to Building 66 until approximately 1946. No documentation has been found that discusses the operation of the smelter, whether radioactive items were processed there, or where the waste from the smelter was disposed. Based on experience at other military bases with a radium paint facility it has been determined that where smelters were in operation, there were radioluminescent materials smelted that generated radioactive slag. It is reasonable to expect that any waste from that operation would have been disposed of in the IR Site 1 disposal area.

IR Site 1 consists of approximately 78 acres total (ALA-HRA-74). Investigations of the past uses of IR Site 1 estimate that between 15,000 and 200,000 tons of assorted refuse and debris including scrap metal, waste oil, aircraft engines, radioactive wastes, solvents, paint

wastes, cleaning compounds, creosote, waste medications, reagents, asbestos, pesticides, mercury, and construction debris have been disposed of there. A burn area was located near the northwest end of the site. In the early years of operation, the burned residue was pushed into the water adjacent to the disposal area. Burial operations involved digging trenches to the water table. The trenches were filled and then compacted to make them level with the surrounding surfaces (**ALA-HRA-5**). Radiation surveys of IR Site 1 have identified discrete anomalies at or near the surface in numerous locations. The surveys are discussed in Section 6.2.9.

Installation Restoration Site 2 is also called the West Beach Landfill (Figure 6-11). This landfill received essentially all wastes generated by former NAS from 1956 to 1978. As early as 1973, the radioactive wastes generated by NAS, NARF, and NADEP were being disposed of by licensed radioactive waste disposal firms at approved disposal facilities (**ALA-HRA-29, 30**). The landfill area is approximately 110 acres. Approximately 30 acres of this landfill is a wetland for the majority of the year (**ALA-HRA-75**). IR Site 2 was used for general disposal purposes. Wastes known to have been disposed of include solvents, metal cleaning compounds, electroplating solutions, paint, paint removers and thinners, sludges, oil, sand blast grit, PCB-contaminated oils, PCB soaked TAC rags, infectious wastes, laboratory wastes, asbestos, tear gas, mercury wastes, inert ordnance and pesticides. Waste was also received on a daily basis from Oak Knoll Hospital, Navy Supply Center Oakland, and Treasure Island Naval Station (**ALA-HRA-5**). Radiation surveys of IR Site 2 have identified radium and strontium devices and suspected radioactive thorium glass. An earthen berm, which is also a jogging trail, surrounds most of IR Site 2. Surveys of IR Site 2 are discussed in Section 6.2.10.

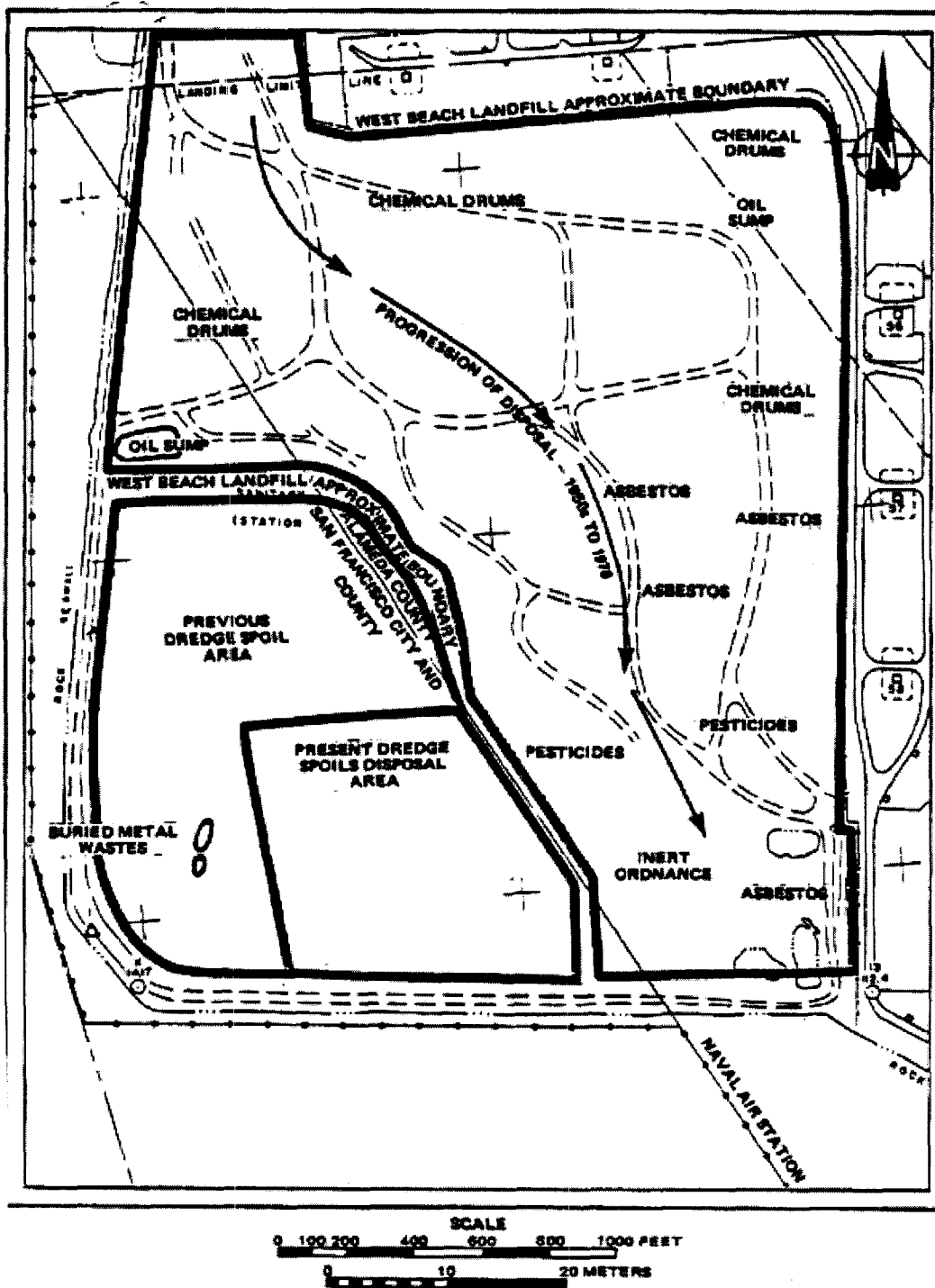


Figure 6-11 Sketch of the West Beach Landfill approximately 1983.

A fenced in area known as the RadShack Area was located inside the boundary of IR Site 2. It is discussed separately because it has a radiological history of its own. The RadShack Area was originally a small wood frame structure surrounded by a locked security fence in the West Beach landfill area just west of Bunker 353. In 1973 the RASO Technical Assistance visit report noted that radioactive waste from Building 400 was sent to the dump for storage in a fenced-in area until picked up by a licensed disposal firm (**ALA-HRA-29**). The 1977 RASO Technical Assistance visit report noted that the waste from Building 400 would be wrapped in plastic bags and packaged in cardboard boxes. Inspection of the RadShack Area during this visit identified a small metal drum with stenciled marking 'Danger, Radioactive Material Inside'. RASO noted that the damp environment could cause the cardboard boxes containing radioactive waste to deteriorate (**ALA-HRA-30**). The 1979 RASO Technical Assistance visit report observed 25 boxes of various sizes labeled radioactive. In addition, there were several small cans marked radioactive and four barrels containing magnesium. The cardboard boxes were beginning to deteriorate as predicted in the 1977 visit (**ALA-HRA-43**). The 1980 RASO Technical Assistance visit report observed two drums with radioactive glass prisms stored in the RadShack Area (**ALA-HRA-44**). Sometime between the 1980 visit and the 1983 visit, the RadShack was emptied. One of the RASO representatives present during the 1983 technical assistance visit reported seeing some radioactive oxygen selector switches on the ground in the fenced-in area (**ALA-HRA-76**). A survey of soil in a controlled area around the building indicated contamination on the ground. A soil sample was analyzed and shown to contain Ra-226 at a concentration of 1.42 picocuries per gram (pCi/g) above background (**ALA-HRA-45**). The Radshack was disposed of in approximately 1998 leaving only the support posts (Figure 6-12).

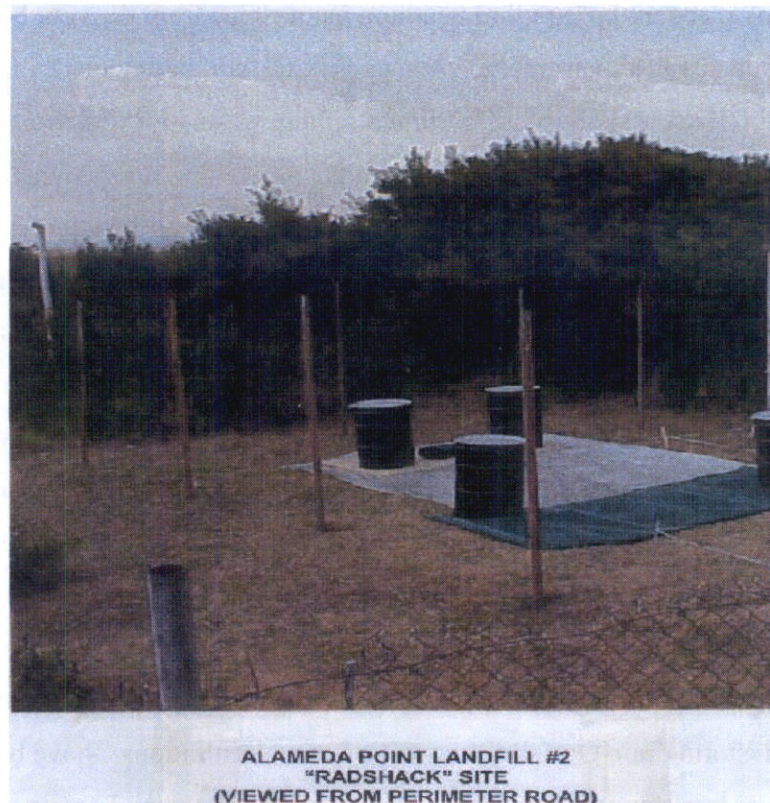


Figure 6-12 Site of RadShack Area (1999 photo)

Preliminary results of eight rounds of groundwater sampling at IR Site 1 performed between June 2002 and April 2004 indicate elevated activities of Ra-226 and radium-228 (Ra-228) at one sampling well, and elevated Sr-90 activity at one sampling well. Even though elevated, the Sr-90 activity is less than the EPA drinking water maximum contaminant level (MCL) for Sr-90 of 8 picocuries per liter (pCi/L) (ALA-HRA-77). Similarly, preliminary results of eight rounds of groundwater sampling at IR Site 2 performed between June 2002 and April 2004 indicate elevated activities of H-3 at one sampling location, and elevated levels of Ra-226 and Ra-228 at 6 sampling locations (4 on the western edge of IR Site 2; and at 2 sampling locations both about 900 feet inland). In the case of the elevated H-3, the highest reading sample (3,810 pCi/L) is significantly below the drinking water MCL of 20,000 pCi/L (ALA-HRA-77).

As previously discussed, the early Navy direction for disposal of liquid waste from radium dial painting operations was to empty "directly into the sewage system." It is likely that

such disposal took place in the Building 5 radium paint shops from the very beginning of painting operations in 1941. This method of disposal was still taking place in Building 400 as late as 1979 (**ALA-HRA-43**). Disposal of liquid radium waste in Building 5 has resulted in internal contamination of drain lines leading from the mezzanine floor down to the main floor where they connect into the storm drain system on the west side of Building 5. Contamination was present in several thousand feet of storm drain system piping leading from the Building 5 area. Contamination was also present in branch lines from other buildings, which eventually discharge in the Seaplane Lagoon. The contamination in the branch lines did not originate from any buildings other than Buildings 5 and 400. The disposal of liquid radium waste from Building 400 second floor has resulted in internal contamination of both sanitary drain system piping and storm drain piping exiting the building on the north side. About 100 feet of sanitary drain piping from Building 400 is contaminated. (Figures 8-3.22.1 and 8-3 22.2 show the storm drain and sanitary drain piping associated with Buildings 5 and 400 and the portions of those systems found to contain measurable concentrations of Ra-226). Sediment samples near the Seaplane Lagoon storm drain Outfall F, show Ra-226 concentrations above background levels. There have been at least four studies of the sediment in the Seaplane Lagoon. In the 1996 study, 10 of 16 samples revealed detectable radium concentrations with the highest (in the vicinity of Outfall F) almost 4 pCi/g (**ALA-HRA-78**). A follow-up sample in 2002 at the approximate same location near Outfall F contained radium concentration of approximately 7 pCi/g (**ALA-HRA-79**).

6.1.2 Depleted Uranium Counterweight Inspection

A 1979 RASO Technical Assistance visit reported (**ALA-HRA-43**) that there were four ailerons in the Building 5 wing shop with DU parts containing removable contamination above the limits of the Radiation Health Protection Manual, NAVMED P-5055. Several additional counterweights were noted in Building 400.

The same report noted that there was a DU counterweight in storage in Building 44. The RASO report stated that some of the counterweights exhibited black UO₂ corrosion. The counterweights with evidence of corrosion were swipe-tested and every one contained removable

alpha contamination above the established limits. The RASO report is not specific as to whether the single counterweight in Building 44 was one with corrosion and hence containing removable contamination. No further mention of DU in Building 44 was noted in the RASO reports and no surveys were conducted. In 1997 a sign was noted in the southeast corner of Building 44 indicating that the area was used for testing of radium dials and gauges (**ALA-HRA-80**).

The 1979 RASO Technical Assistance visit devoted considerable attention to the handling of DU counterweights. Carrier-based S-3A aircraft contained approximately 21 DU counterweights. There previously had been noted considerable corrosion of the DU counterweights on the elevator assemblies of carrier-based aircraft. The RASO report noted there were two S-3A aircraft in the assembly and test shop area of Building 400 where DU counterweights were removed. An unnumbered room inside of room 204 on the second floor of Building 400 (see Figure 6-9) was at one time the storage area for DU counterweights after removal from the aircraft.

Building 309 is a small (108 square foot) building at the southeast corner of Hangar 12. This building is reported to have been used for storage of DU counterweights (**ALA-HRA-81**). No further information has been identified regarding radioactive material storage in Building 309.

Building 310 is a small (108 square foot) building at the southeast corner of Building 400. It is identical to Building 309. A 1980 RASO Technical Assistance visit report noted that Building 310 was used for storage of new and corroded DU counterweights (**ALA-HRA-44**). A swipe survey conducted by RASO showed no loose contamination. Again, in 1983, a RASO Technical Assistance visit report noted that Building 310 was being used for radioactive (radium) waste storage (**ALA-HRA-45**). Fixed and loose contamination was within acceptable limits. In 1985 RASO conducted another Technical Assistance visit. The report of this visit notes that both fixed and removable contamination was above limits and further there was a radiation area inside the building that was not properly posted (**ALA-HRA-46**). Building 310 was surveyed and decontaminated (**ALA-HRA-82**). The survey is discussed in Section 6.2.5.

During a 1983 RASO Technical Assistance Visit, a DU work area in Hangar 12 was inspected. A roped off area in the north end of the hangar was used primarily for the handling of DU counterweights. The RASO representative observed that the contamination control work practices of the personnel working in the area could potentially result in spreading of contamination. He further noted that the radioactive waste generated was not being separately controlled but rather was discarded with other waste. The RASO representative also took nine swipe samples in the DU work area to analyze for alpha contamination. Of the nine swipes, two on a workbench and one on the floor in the work area indicated alpha contamination above the Navy limit of 50 disintegrations per minute per 100 square centimeters (dpm/100cm²). The report issued by RASO contained recommendations for the NARF to decontaminate the area and to improve contamination controls and waste handling (ALA-HRA-45). A subsequent RASO Technical Assistance Visit in 1985 listed the same findings relative to lack of contamination control and lack of proper waste handling and segregation (ALA-HRA-46). Three subsequent Technical Assistance Visits in 1988, 1991, and 1994 did not discuss DU and did not identify any problems in Hangar 12 (ALA-HRA-47, 48, 49).

In August 1995, a RASO representative surveyed the area of Hangar 12 previously identified as the DU work area. A brief description of the area surveyed, a description of the actual survey and survey results was issued in December 1995. The actual survey involved gridding the area in 1-meter squares and performing both scans and static surveys in each grid. No measurements exceeded the guideline levels for DU (ALA-HRA-83). A representative of the California Department of Health Services observed the RASO survey (ALA-HRA-84). The survey results are discussed in Section 6.2.3.

6.1.3 Overhaul and Repair of Aircraft Engine Igniters

The Ignition Shop in Building 66 was used for inspection, storage and repair of spark-gap irradiators containing Cs-137, UO₂, Co-60, or Kr-85. The RASO Technical Assistance visit in September 1977 noted that there were spark gap irradiators in the ignition shop and that adequate controls for the safe handling of the spark gap irradiators were not practiced (ALA-HRA-30). Specifically, there were no controls to prevent damage or breakage. The 1980 RASO Technical

Assistance visit returned to Building 66 and noted two locations with both alpha and beta-gamma contamination above the limits. A recommendation was made to initiate a procedure for handling and disposal of broken or spent tubes (**ALA-HRA-44**). The ignition shop in Building 66 was surveyed in 1997. The survey did not detect any residual contamination (**ALA-HRA-85**). In November 1997, RASO reported that Building 66 met the criteria for release (**ALA-HRA-86**). The survey of the ignition shop is discussed in Section 6.2.4.

Spark-gap irradiators containing radioactive Cs-137, Kr-85, UO₂ or Co-60 were also reported to be located on the third floor of Building 400. The exact location is not known (**ALA-HRA-87**).

6.1.4 Licensed Operations

On July 17, 1981, the NRC issued a materials license to the NARF Materials Engineering Division for possession and use of Ni-63 sources contained in a Hewlett-Packard gas chromatograph. The license, number 04-19811-01, authorized use of the Ni-63 sources only at Building 42. A RASO Technical Assistance visit report in 1983 noted that the radiation level around the gas chromatograph was less than 0.1 millirem per hour (mrem/hr). The report also noted that the unit vented into the laboratory room instead of to the outside as required by the materials license (**ALA-HRA-45**). In 1985, a new Materials Engineering Laboratory (Building 7) was constructed. The NRC changed the materials license in 1986 to authorize possession and use of the Ni-63 sources in the new building (**ALA-HRA-37**). In 1987, the NRC materials license was converted to NRMP 04-65885-K1NP (**ALA-HRA-38**). Typically, when an NRC materials license is terminated, the NRC makes an inspection to ensure no there is no residual radioactive material. Because the license was converted to an NRMP rather than terminated, there was no inspection by the NRC. In 1988, a RASO Technical Assistance visit noted that the gas chromatograph was being operated satisfactorily. In October 1988, the NAVY redesignated all NARFs as NADEPs. In June 1989, the NADEP reported that the Ni-63 source used in the gas chromatograph was missing. The investigation conducted by the NADEP determined that the source assembly had been removed from the gas chromatograph in March 1989 and had been stored in a drawer under the gas chromatograph in preparation for return to the vendor. The

source assembly was last seen about 2 weeks later. The NADEP determined the source assembly was missing approximately the first week in May 1989 when a swipe test of the assembly was to be performed prior to making it ready for shipment. Notification of supervision and a concerted effort to locate the missing source assembly did not take place until late June 1989. Physical inspections of every room of Building 7 did not locate the missing source. The source was never recovered. The investigation report includes a diagram of the Electron Capture Detector (ECD) assembly that contains the Ni-63 plated source. Without destructive disassembly of the ECD, the actual source is not accessible. In addition, because Ni-63 emits only a single low energy beta particle, it does not pose a radiation hazard and in fact is not detectable outside the assembly (ALA-HRA-88). A replacement ECD was received in early June. The NRMP for possession and use of the Ni-63 source expired on July 31, 1991. NADEP failed to submit an application for renewal before the NRMP expired. Therefore, a new NRMP (04-65885-K2NP) (ALA-HRA-89) was issued on February 12, 1992. A follow-up RASO Technical Assistance visit in 1994 noted that the gas chromatograph was maintained in room 212 of Building 7 (ALA-HRA-49). Amendment 1 to the NRMP (ALA-HRA-90) added a second gas chromatograph unit in 1995. In August 1996, in anticipation of the upcoming closure of the NAS, one of the two gas chromatograph units (the Hewlett-Packard unit) was returned to the vendor. Swipe surveys taken of the ECD demonstrated that there was no leakage of the source. A Hewlett-Packard representative signed for custody of the transferred unit. The second unit (Shimadzu) was transferred from the NADEP to the NAS under a new NRMP No. 04-00236-K1NP (ALA-HRA-91). Because the unit was transferred, a swipe survey was also performed on that unit. No leakage was evident. Shortly after the new NRMP was issued, the previous NRMP (04-65885 – K2NP) was terminated (ALA-HRA-92). Finally, in 1997, the one remaining gas chromatograph unit (Shimadzu) was returned to the vendor and the NRMP was terminated. The termination documentation includes verification of swipe surveys of the sources before transfer and verification of receipt of the sources by the vendor (ALA-HRA-93). A 1997 cleanup plan for Building 7 includes a diagram of the second floor showing room 212 where the Hewlett-Packard gas chromatograph was used. It also shows a janitor's closet, room 205, where a sealed Ni-63 radioactive source for the Shimadzu gas chromatograph was stored (ALA-HRA-94). Radiation

and contamination surveys of Building 7 are discussed in Section 6.2.2. The survey did not include room 205 (ALA-HRA-95).

6.1.5 Decontamination of Aircraft Engines

In 1951, the United States was conducting atmospheric tests of nuclear weapons. The tests included aerial surveillance, tracking of the radioactive cloud and many other operations that resulted in the potential for flying airplanes through a radioactive cloud. The military was interested in determining what was needed to decontaminate aircraft following these tests. One of the investigations involved disassembly and decontamination of the aircraft engines. With technical direction and assistance from the radiation experts at NRDL, former NAS disassembled and decontaminated two contaminated aircraft engines in 1951. The location of the engine disassembly and decontamination is not known, however, the O/R Department personnel performed the work, and it was likely performed in one of the following three facilities: Building 5, Building 66, or Building 113. It is likely that the contaminants included Sr-90, Pu-239 and Cs-137. The first contaminated engine was from a B-17 bomber and was decontaminated before early September 1951 (exact date unknown). This engine was disassembled and decontaminated for the BUAERO Projects Officer at NRDL (ALA-HRA-96). In parallel with the work at former NAS, another B-17 engine was undergoing decontamination at McClellan Air Force Base in Sacramento, California. Initial contamination measurements were taken on the pistons and valves of each of the engines and then several different methods of decontamination were attempted. The components were soaked in a decontamination fluid, abrasive blasted with sand or seeds, acid etched, and wire brushed. The success of the various methods of decontamination was determined by follow-up contamination measurements. NRDL prepared the report on the decontamination efforts (ALA-HRA-97). A second aircraft engine was decontaminated at former NAS in November 1951. The second engine was a jet engine from a U. S Air Force T-33 jet aircraft. As with the first contaminated engine, the decontamination operations were conducted under the direction of NRDL personnel as required by the BUAERO (ALA-HRA-98, 99). The jet engine was decontaminated and overhauled by O/R Department personnel (ALA-HRA-100). The location of the disassembly and decontaminations is not known. This work may have been performed in Building 5 as that building was the engine overhaul location since

the NAS was opened in 1941. The disassembly and decontamination may also have been performed in Building 66 (jet engine overhaul shop) or in Building 113 (jet engine overhaul shop). Facility diagrams of Buildings 66 (**ALA-HRA-101**) and 113 (**ALA-HRA-102**) are not conclusive that the contaminated engine overhaul was performed in either facility. Buildings 66 and 113 were placed in service as jet engine overhaul shops in 1948 (**ALA-HRA-50**).

6.1.6 Smelter Operations

An April 1949 drawing showed the proposed location of a new Turbo Jet Overhaul Facility. The new overhaul facility was to be constructed just to the east of Building 66 (**ALA-HRA-103**). The new Turbo Jet facility was not actually built. However, the proposed footprint of the new building was shown to include metal scrap bins identified as Building 99 and a smelter that was unnumbered. It is possible that radium components were melted down along with other metal components at this location. Slag from the smelter operation would likely have been disposed of in IR Site 1 along with other waste. The metal scrap bins, which were the feed for the smelter, were demolished in the early 1950s. It is likely the smelter was at least secured at the same time. By 1954, Buildings 398 and 399 were shown on the station map in the location where the proposed Turbo Jet Overhaul facility was to be constructed with the smelter no longer present.

6.1.7 Radioactive Materials Storage and On-site Disposal

Four former NAS structures (including a conex box) have been used or are still in use as temporary radioactive storage areas. These are Building 114, Building 346, Bunker 353, and the conex box. The three buildings had no indication of being contaminated. The conex box was disposed of as radioactive waste (**ALA-HRA-82**).

Building 114 was a Public Works Department offices and maintenance shops building. It was used for a short time in May 1995 to store the contaminated piping removed from Building 5 before it was discovered to contain radioactivity. The investigation of this problem included a recommendation that the potentially contaminated area in Building 114 be surveyed. It is likely the survey was accomplished but there is no documentation to indicate that fact (**ALA-HRA-**

104). The exact location used for temporary storage of the pipe within the Building 114 complex was not identified.

Building 346 is a small Quonset style building just to the west of Building 5. A portion of this building was used for storage of investigation-derived waste during the cleanup of Buildings 5 and 400 (**ALA-HRA-105**). In addition to being a temporary storage area for radioactive waste, Building 346 was also the equipment storage building for at least one contractor performing radiological work on former NAS. There is no indication as to what isotopes were involved in the waste, but it is likely that they included Ra-226, DU, and Cs-137. Radioactive Ra-226 check sources (kapton sandwich) were removed by the contractor from a file cabinet in the building in mid-2005. After removal, the sources were swipe tested. The swipe test did not reveal loose contamination and therefore verified the sources to be intact (not leaking) (**ALA-HRA-106**).

Bunker 353 is located within the boundaries of Installation Restoration (IR) Site 2. In 1999 during the removal of some of the buried radioactive anomalies discovered in the RadShack Area of IR Site 2, the bunker was used as a staging area for the radiation survey equipment, and as a temporary storage site for radioactive material removed. The radioactive items were contained in individual re-sealable plastic bags or in some cases in small tape-sealed clear plastic containers. The plastic bags or clear plastic containers were then placed in a larger plastic container. In addition to the discrete items, fifteen 55-gallon drums of contaminated soil removed from the RadShack Area were temporarily stored in the bunker. The radioactive items stored in Bunker 353 included Ra-226 devices, Sr-90 devices, a convex lens (Th-232), plastic warning sign pieces and some visually unidentifiable items (**ALA-HRA-107**). After temporary storage in Bunker 353, the drums and the individual radioactive items were transferred to Building 5 to await disposal. In June 2005, a visual inspection of Bunker 353 noted that the bunker is currently being used for temporary storage of radioactive items recovered from IR Site 1 during the 2004 survey (**ALA-HRA-74**).

A conex box was used to store the contaminated piping that had been removed from Building 5. After the piping was determined to be contaminated, it was stored in the conex box

at the NAS scrap yard near Building 67. The conex box was also identified as the radium storage locker and the sea-land container in historical documents (ALA-HRA-82). After the contaminated piping was removed from the conex box, a survey was performed. Fixed contamination above the NRC release limits was detected and could not be removed after two attempts at decontamination. The conex box was shipped to a radioactive waste disposal site in 1996 (ALA-HRA-82).

6.1.8 DRMO Operations

An approximately 9-acre portion of the Alameda Annex served as the DRMO scrap yard. In this location, material was screened for resale or designated for disposal as scrap. Radioactive materials were not supposed to be disposed of via the DRMO operation. However, some DRMO scrap yards received equipment and components for disposal that contain radioactive materials (principally radium). In 1994 the DRMO scrap yard at Alameda Annex was surveyed with a gamma scintillation detector and found to contain three pallets of firebrick (naturally occurring uranium) and three small drums of DU (ALA-HRA-108). The firebrick and drums of DU were subsequently removed. A second radiation survey was conducted in the approximately 9-acre area in 2002 (ALA-HRA-109). The second survey concentrated on the three areas where the firebrick and DU were found in 1994. Gamma surveys and soil samples from the surface and from below surface indicated the three areas were essentially background. There was no indication of radioactive contamination. In November 2003, CDHS concurred with the release of the DRMO scrap yard, also identified as Installation Restoration Site 02 of the Fleet Industrial Supply Center-Oakland, Alameda Facility/Alameda Annex (ALA-HRA-110).

6.2 HISTORICAL INVESTIGATIONS AND SURVEYS

Several of the buildings and sites identified herein as impacted or potentially impacted sites have been the subject of radiological surveys and sampling. Some remediation has been performed as well. The following paragraphs briefly describe the surveys that have been performed, the results of those surveys, and the remediation where performed. Table 6-1 provides a summary of the investigations and the sub-section where the investigation is described.

6.2.1 Building 5

A survey of the X-ray room of Building 5 was performed in April 1996. This area was being used for storage of H-3 entry/exit signs. After thirteen 55-gallon drums of H-3 signs were removed, the surveys for contamination consisted of gridding the entire room and surveying each grid for low-level beta-gamma radiation. The surveys did not detect any anomalies above background. Each grid was swipe surveyed for H-3. No H-3 contamination was detected (**ALA-HRA-82**). RASO review of the survey of the X-ray room concluded the former H-3 storage area met the criteria for release for unrestricted use (**ALA-HRA-107**).

Also in 1996, the old bearing shop (rooms 223 and 227) on the mezzanine floor of Building 5 was surveyed. Elevated beta activity was detected on the floor and north wall of room 227C. In addition, a survey of storm drains identified radioactivity in the drain line inside Building 5 leading out to the Storm Drain Line F (**ALA-HRA-112**).

Based on the 1996 surveys, remediation of surface contamination and radioactively contaminated piping was conducted in 1998. Floor coverings, walls, mastic adhesive under floor covering and accessible drain piping from the Bearing Shop on the mezzanine floor down to the small paints shop below were removed. Approximately 3,000 ft² of linoleum and mastic were removed from rooms 223A, 223B, 223C, 223D, 227A, and 227B. The sinks were removed from rooms 223B and 227B. Approximately 400 ft² of floor leveling grout was removed from room 227C, and approximately 84 ft² of wall from the north and west walls were removed. A strip of concrete surface that was under the removed north wall was also removed. Approximately 270 feet of steel and plastic piping were removed from the bearing shop and small parts paint shop to the fire main test drains and the industrial waste connection from the drain sump (**ALA-HRA-113**).

Between October 1998 and April 2000, closeout surveys of the affected portions of Building 5 were completed. Surveys were Class 1, Class 2 or Class 3 as defined by MARSSIM. The level of survey was determined based on the previous contamination history. Surveys in Rooms 234 and 4 included static and scan measurements of the existing exhaust ducts. The survey report indicates that for Class 1 areas "Where air exhaust ducts are present, the ducts were swiped". Swipe test results for ventilation exhaust ducts in each of the three radium paint facility locations indicate no removable contamination was present. The survey report concludes that the

Building 5 is suitable for reuse in accordance with application of MARSSIM survey technology (ALA-HRA-59).

6.2.2 Building 7

Three laboratory rooms and an adjacent hallway on the second floor of Building 7 were surveyed for residual radioactivity in October 1997. The only known isotope used in the building was Ni-63 contained in the ECD of the gas chromatograph. Ni-63 is a weak beta emitter. Surveys were performed for alpha, beta, and gamma radiations and consisted of scans for alpha, beta, and gamma, and exposure rate measurements for gamma radiation. In addition, swipe surveys were taken on all surfaces monitored and from the interior of the ventilation hoods. The scan survey results were no different from background. The exposure rate surveys were the same as background, and the swipe surveys were no different from background (ALA-HRA-95). Section 6.1.4 notes that a radioactive source was stored in the janitor's closet, room 205. The janitor's closet was not surveyed but the Ni-63 sources were leak tested satisfactorily before transfer and there was no indication of a source failure. A 1997 RASO review of the surveys performed in Building 7 concluded the building was acceptable for release (ALA-HRA-86).

6.2.3 Hangar 12

In 1983, during a routine RASO Technical Assistance visit, a survey detected contamination above acceptable limits in the DU work area in Hangar 12 (ALA-HRA-45). In August 1995, a RASO representative surveyed the area of Hangar 12 previously identified as the DU work area. The survey in 1995 was performed in order to expedite release of the hangar for commercial uses. RASO issued a brief description of the area surveyed, a description of the actual survey and survey results in December 1995. The actual survey involved gridding the area in 1-meter squares and performing both scans and static surveys in each grid. No measurements exceeded the guideline levels for DU, although one small spot with measurable alpha and beta levels was removed (ALA-HRA-83). The RASO report of survey concludes the hangar is suitable for direct turnover for public use. A representative of the CDHS observed the survey, performed some confirmation surveys and concurred with the unrestricted release of the hangar (ALA-HRA-84).

6.2.4 Building 66

The cleanup plan for Building 66 reports that the room in the northwest corner of the building was used for work on radioactive components (**ALA-HRA-114**). This room was surveyed in October 1997. The radioactive spark gap irradiators used in engine ignition equipment could incorporate Cs-137, UO₂, Co-60, or Kr-85. Surveys were performed for beta and gamma radiation. Direct measurements were performed for beta contamination. Swipe surveys were analyzed for removable beta contamination at each location as well. Gamma exposure rates were measured at 1 meter above the floors. All surveys indicated no contamination above background. The survey report incorrectly indicates that the area to be surveyed was not gridded because there was no history of radioactivity use in the building (**ALA-HRA-115**). In fact, there had been contamination detected in the ignition shop during a RASO Technical Assistance visit (**ALA-HRA-44**). RASO review of the Building 66 surveys concludes the building meets the NRC criteria for release for unrestricted use (**ALA-HRA-86**).

6.2.5 Building 310

In April 1996, Building 310 (small storage bunker) was still in use as a storage area for DU counterweights. The building had previously been a storage area for radium waste as well. The DU counterweights were placed in eleven 55-gallon drums and transferred off base in preparation for disposal. It was noted that yellowish powder indicative of oxidized uranium was present throughout the storage bunker. The floors, walls and storage shelves were all contaminated with removable contamination. The entire building was decontaminated in April 1996. Resurveys still indicated both fixed and removable contamination on the storage shelves. The storage shelves were removed and cut up and disposed of as radioactive waste at an approved radioactive waste disposal site. Final surveys of the building included marking 1-square meter grids on all surfaces. Each grid was surveyed for fixed beta-gamma contamination, for fixed alpha contamination and each grid was surveyed for beta-gamma dose rate. Each grid was also surveyed for loose beta-gamma and alpha contamination and for loose tritium contamination. All surveys met the criteria of the Nuclear Regulatory Commission Guide 1.86 (**ALA-HRA-82**). RASO review of the Building 310 survey in May 1996 concluded the building

meets the criteria for release for unrestricted use (**ALA-HRA-111**). No additional surveys are considered necessary in Building 310; however, regulatory agency concurrence is required.

6.2.6 Bunker 353

Bunker 353, which is located in the northwest corner of IR Site 2, was used as a temporary storage area for the radioactive anomalies recovered during the 1998/1999 survey of IR Site 2 and the RadShack Area. After that material was shipped out, the floor of the bunker was gridded, surveyed, and verified free of contamination (**ALA-HRA-107**). Another survey of the floor for alpha and beta contamination and a radiation dose rate survey were performed in the bunker prior to again using the bunker as a temporary storage area in 2004. No areas were greater than ambient background (**ALA-HRA-74**). The bunker is currently in use as a temporary storage area for radioactive material.

6.2.7 Building 400

In 1996, the equipment in various rooms of Building 400 suspected to be contaminated was surveyed for alpha radioactivity. In this survey, the equipment in the rooms was left in place to identify the contaminated vs. non-contaminated equipment and to remove or isolate the contamination. On the north side of the building, the equipment in rooms 203 and 204 was surveyed. Alpha contamination above the release criteria was present on portions of a workbench in room 203. No alpha contamination was noted in room 204. On the south side of the second floor, rooms 210, 211, 213, and 214 were surveyed. Two workbenches and a large cabinet were found to be alpha contaminated in room 210; and a workbench in room 213 was contaminated. In addition to equipment, the sinks and drain lines in rooms 211 (men's restroom) and 214 (women's restroom) were surveyed. No alpha contamination was noted. The contaminated portions of the workbenches and the cabinet from room 210 were wrapped in plastic. The contaminated equipment was temporarily stored in room 210 and subsequently moved to Building 5 in preparation for disposal (**ALA-HRA-116**). In a separate survey, alpha contamination was detected at several locations in room 204 and on the floor of room 210 (**ALA-HRA-117**). Based on the 1996 surveys, remediation of surface contamination and radioactively contaminated piping was conducted in 1998. All potentially contaminated piping

from rooms 203, 204, and 213 was removed down through the first floor and out to the outside of the building on the north side. Portions of walls in rooms 203 and 204 and the flooring in both rooms were removed. Flooring in rooms 210 and 213 was also removed (**ALA-HRA-113**). All radioactive waste was transported to Building 5 for storage and later disposal. Between October 1998 and April 2000 closeout surveys of the affected portions of Building 400 were completed. Surveys were Class 1, Class 2 or Class 3 as defined by MARSSIM. The level of survey was determined based on the previous contamination history. The survey report indicates that for Class 1 areas "Where air exhaust ducts are present, the ducts were swiped." No data for swipe survey results in Building 400 are included in the survey report. The survey report concludes that the Building 400 is suitable for reuse in accordance with application of MARSSIM survey technology (**ALA-HRA-59**).

6.2.8 Bunker 497

Bunker 497 a 7-cell bunker was surveyed as a MARSSIM Class 3 area. There was no expectation that the bunker or any cell of the bunker would contain residual radioactivity. The survey was warranted based on possible prior use. The bunker was surveyed in November 1998. Each cell of the bunker was approximately 22 feet wide by 25 feet long. The cells were marked off in 16 approximately 4 by 4.5 foot grids for ease of reference. The survey employed a handcart containing two sodium iodide (NaI) detectors and three beta-gamma pancake probes to scan 10% of the floor area of each cell. The highest reading detector of each type was compared to previously established background readings. All measurements were below the background levels. Stationary gamma surveys in each grid were all below previously established background levels. Stationary alpha and beta surveys in each grid were below NRC contamination limits. Tritium swipes were collected in half of the grids in each cell. Stationary tritium readings were taken in the remaining grids in each cell. No tritium contamination was detected (**ALA-HRA-118**). RASO performed confirmation surveys in August 2000 and concluded that the Bunker 497 is releasable for unrestricted use (**ALA-HRA-119**). Release of the bunker requires Navy and regulatory agency review of the final survey results.

6.2.9 Installation Restoration Site 1

IR Site 1 was surveyed on four separate occasions. The first survey, in 1995, was a surface area survey on 20-meter grid point spacing. The second survey, in 1996, concentrated on the former jogging trail and the northwest portion of IR Site 1. These two surveys confirmed that radioactive items had been disposed of at various locations in the disposal area (**ALA-HRA-112**). Some anomalies were recovered during these two surveys. The third and fourth surveys (in 1998/1999 [**ALA-HRA-120**] and in 2004 [**ALA-HRA-74**]) are significant in that they were comprehensive high-density surveys. Each survey made use of multiple detectors on a trailer pulled by a tractor or other vehicle. The detector output was coupled to a global positioning system and a computer such that precise coordinates were recorded for each set of detector data. The detectors were at a fixed height above the ground surface and were capable of detecting radium painted components buried up to 18 inches below the surface. At least one radiation reading was taken for each square foot of land surveyed. The survey maps produced by both of the high-density surveys are in close agreement in locating the radioactive material on and near the surface of the disposal area. The 2004 survey also collected 25 soil samples that were analyzed for Ra-226 and Sr-90. The samples were collected at locations indicated by elevated radiation levels. All of the soil samples had Ra-226 concentrations above the reference background levels and nine of the samples had Sr-90 levels above background levels. In situ gamma spectroscopy was used to analyze the soil at 13 of the highest survey readings. All of the in situ analyses indicated the presence of Ra-226 (**ALA-HRA-74**). Some areas immediately adjacent to the shoreline and in rip-rap concentrations were not accessible even for an individual carrying a single hand-held detector and therefore were not surveyed.

Preliminary results of eight rounds of groundwater sampling at IR Site 1 performed between June 2002 and April 2004 indicate elevated activities of Ra-226 and Ra-228 at one sampling well, and elevated Sr-90 activity at one sampling well. Even though elevated, the Sr-90 activity is less than the EPA drinking water maximum contaminant level (MCL) for Sr-90 of 8 pCi/L (**ALA-HRA-77**).

A Time Critical Removal Action is in progress in Site 1 to accomplish the removal of radium anomalies, radium contaminated soil and material potentially presenting an explosive hazard.

6.2.10 Installation Restoration Site 2

IR Site 2 or West Beach Landfill was surveyed on three occasions. The first survey, in 1995, was a grid survey. One anomaly was recovered from the landfill during this survey. Similar to the discussion above for IR Site 1, the significant surveys of this landfill are the final two (in 1998/1999 and in 2004) (**ALA-HRA-120, 75**). Some remediation was performed in the IR Site 2 area at the conclusion of the 1998/1999 high-density survey. The 50 highest reading locations were excavated and discrete anomalies were removed. Soil sampling and soil removal in each excavation was done until the radiation levels reached less than an established upper limit of 20,000 counts per minute (cpm). This limit was employed because at the time the Navy and the regulatory agencies had not established a specific cleanup goal (**ALA-HRA-107**). The 2004 high-density survey was performed similar to the 2004 survey of IR Site 1. Five soil samples were collected of which four had Ra-226 at or above the background concentration. One sample had a low, but detectable concentration of Sr-90, as well. Some areas immediately adjacent to the shoreline and in rip-rap concentrations were not accessible even for an individual carrying a single hand-held detector and therefore were not surveyed.

Preliminary results of eight rounds of groundwater sampling at IR Site 2 performed between June 2002 and April 2004 indicate elevated activities of tritium at one sampling location, and elevated levels of Ra-226 and Ra-228 at 6 sampling locations (4 on the western edge of IR Site 2; and 2 sampling locations both about 900 feet inland). In the case of the elevated tritium, the highest reading sample (3810 pCi/L) is significantly below the EPA drinking water MCL of 20,000 pCi/L (**ALA-HRA-77**).

A Time Critical Removal Action is in progress in Site 2 to accomplish the removal of radium anomalies, radium contaminated soil and material potentially presenting an explosive hazard.

6.2.11 RadShack Area

The RadShack Area of IR Site 2 was surveyed in July 1999, as part of the excavation of the 50 high reading areas in IR Site 2. The RadShack Area was also excavated. The actual structure had been previously removed leaving only the support posts. As part of the survey the ten support posts were removed. A rectangular area surrounding the location of the shack was hand surveyed and ten locations within and immediately adjacent to the former shack were excavated until the radiation levels at all locations within the area were below a screening level of 20,000 counts per minute. After completion of the excavation, clean fill soil was used to refill all the excavation in the RadShack Area (ALA-HRA-107).

6.2.12 Pier 3

In August 1996, radiological remediation of a small section of crane rail was completed on Pier 3 (Figure 6-13). It is assumed that the area in question was contaminated by a strontium-90 deck marker that was crushed by the pier crane.

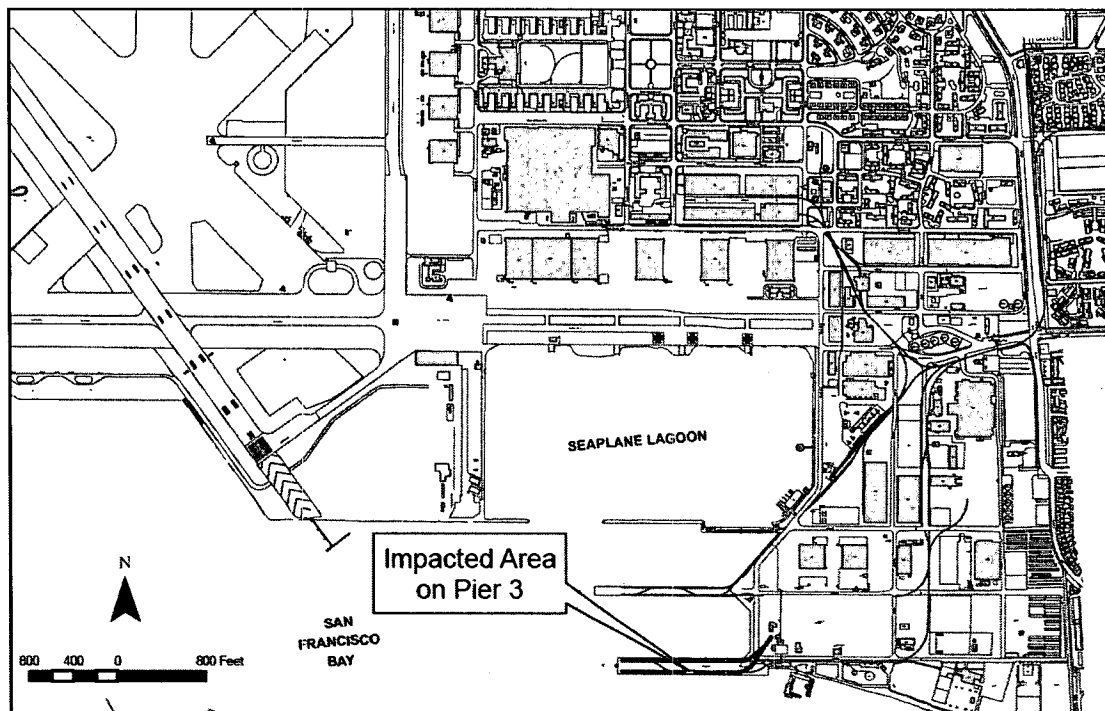


Figure 6-13 Pier 3 survey area

Remediation was accomplished by removing an approximately 9-foot section of crane rail and the asphalt and concrete around and below the crane rail. Direct surveys and solid samples taken after the remediation effort confirmed there was no residual contamination due to the strontium deck marker (**ALA-HRA-121**).

6.2.13 Storm Drain and Sanitary Drain Systems

In January of 1996, a contractor working on a project unrelated to radioactivity became aware that there was a potential for radioactivity to be present at some of the locations they intended to sample as part of a storm water sampling. Investigation indicated radiation levels above background at some storm drain manholes and outfalls and other storm water sampling locations. This information was forwarded to the Navy (**ALA-HRA-122**).

Initial characterization of the drain lines, storm drain lines and storm drain manholes associated with Buildings 5 and 400 was conducted in 1996. The characterization survey was performed by pulling a NaI detector through the storm drain lines. Approximately 1,000 feet of the main storm drain line between Building 5 and the Seaplane Lagoon were surveyed in August and September 1996. In addition, several manholes in the main storm drain line and the main branch lines were surveyed. Contamination was identified in the main storm drain line and in drain lines exiting Buildings 5 and 400. The report of the survey concluded that the branch lines may have become contaminated due to back-flow from the Seaplane Lagoon during high tide events.

A detailed investigation of the storm drains was conducted in December 1997 (**ALA-HRA-123**). The survey included almost 6,000 feet of storm drain and sanitary drain piping. In addition, several solid samples were collected for gamma spectroscopy analyses. The samples were taken at the storm drain outfalls and from some of the system manholes in the system. Approximately 4,000 feet of storm and sanitary drain piping contained radium above the detection limits. Removal and replacement or in-place decontamination of storm drain piping and manholes was performed during the period of November 1998 through October 1999. More than 700 feet of contaminated piping outside of Building 5 was removed. Approximately 700 feet of contaminated piping was decontaminated by hydroblasting. This included piping from

both Building 5 and Building 400. Three contaminated manholes near Building 5 were removed and replaced. Concrete, asphalt, and overburden soil removed to gain access to the storm drain and sanitary drain piping were surveyed and sampled. Materials exceeding guideline levels for free release were disposed of as contaminated waste. Overburden soil found to be below the release level of 5 pCi/g of Ra-226 was retained for reinstallation in the trenches after piping removal, replacement or decontamination (**ALA-HRA-124**). Figures 8-3.22.1 and 8-3.22.2 show the storm drain and sanitary drain piping associated with Buildings 5 and 400 and the portions of those systems found to contain measurable concentrations of Ra-226. Additional remediation will be required in the storm drain and sanitary drain piping systems.

6.2.14 Seaplane Lagoon

In 1996, a detailed set of sediment samples was collected from the Seaplane Lagoon and analyzed for Ra-226, Ra-228, Cs-137, potassium (K-40), Th-234, and U-235. Sediment samples were collected at 45 locations throughout the Seaplane Lagoon. The samples were split into sections by depth as follows: 0 to 0.3 feet, 0.3 to 2.0 feet, 2.0 to 5.0 feet, and greater than 5 feet. Not every sample was analyzed for all isotopes, and not every sample was analyzed for each of the 4 depth sections. Analyses detected Ra-226 in more than 30 of the individual samples. The highest concentration of 3.92 pCi/g (approximately four times background levels) was detected at a sediment depth of about 2.5 feet at a sample location adjacent to storm drain outfall F in the northwest corner of the lagoon (**ALA-HRA-78**). In November 2002, a joint sampling program between the University of California at Berkeley and Battelle Institute collected sediment samples at 20 locations inside and near the mouth of the Seaplane Lagoon. This sampling was to study the depositional history of the lagoon. Analysis methods include both chemical and radiochemical means. Radiochemistry data from one sample (BERC 13) which was in proximity to the highest sample from the 1996 sampling, and also adjacent to outfall F indicated a maximum concentration of Ra-226 of approximately 7 pCi/g (approximately seven times background levels) at a depth of about 3.5 feet (**ALA-HRA-79**). No further action has been taken regarding the samples containing elevated radium concentrations.

6.2.15 Seaplane Ramp

It was suspected that people working in Building 400 might have spilled radium waste being carried from the building to Seaplane Lagoon. The 1998 100 percent gamma survey of the seaplane ramp and parking area yielded no radioactive anomalies (**ALA-HRA-125**). The area of the ramp and adjacent parking apron were scanned with a gamma scintillation detector. No evidence of radioactivity was detected.

6.2.16 Alameda Annex

Two surveys have been performed in the DRMO scrap yard area of the FISCA. The scrap yard is also identified as Installation Restoration Site 02 of the FISCA. The 1996 survey identified the presence of three small drums containing DU. One of the drums was open and the contents were covered with rainwater. This survey also identified the presence of some pallets of firebrick, which is sometimes high in naturally occurring radioactive material such as uranium and thorium. The survey area was divided into grids 50 feet on a side. Gamma readings were taken at ground level and at 3 feet above ground level at each grid point. The survey identified ten anomalous locations. The survey report contained a recommendation to sample the soil in the area of the drums of DU. The survey covered the outside areas of the scrap yard except where there were scrap piles preventing access to the grid location. The inside of the hangar, Building 365, was not surveyed (**ALA-HRA-108**). In 2002, a resurvey of the DRMO scrap yard concentrated on the locations identified during the earlier survey. During this survey, three rectangular areas (approximately 10,000 ft², 15,000 ft² and 22,500 ft²) were surveyed with multiple gamma scintillation detectors mounted on a trailer. Soil samples were collected in each of the three areas. All samples were analyzed for radium. The radium concentration was significantly below 1.0 pCi/g in each of the three areas. The soil samples in the area where the DU was found in the 1996 survey were also analyzed for uranium isotopes. The U-238, U-235 and U-234 concentrations in all samples were less than 1.0 pCi/g. In two of the three areas surveyed no gamma readings were detected above the mean plus two standard deviations of the mean. In one area there were four readings that exceeded the mean plus 2 standard deviations value. Additional samples were collected and analyzed. No samples exceeded the derived

concentration guideline levels (DCGL's) for radium or uranium. The 2002 survey did not cover the entire approximately 9 acres. Actual survey area of the three rectangular areas was approximately 1.1 acres (**ALA-HRA-109**).

Based on the 2002 survey results, DTSC and CDHS agreed that Installation Restoration Site 02 of FISCA was suitable for unrestricted release (**ALA-HRA-110**).

SECTION 6

TABLES

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TABLE 6-1
RADIOLOGICAL SITE INVESTIGATIONS SUMMARY

Building No. or Area	G-RAM Use by NAS	Investigations and surveys performed	Section No.
Bldg 5	Mezzanine housed the 1 st radium paint shop at NAS Alameda (1941); 2 nd radium paint shop location (1947); & 3 rd radium paint shop location (1954); possibility of contaminated (Cs-137, Sr-90, Pu-239) jet engine decontamination (1951); DU ailerons stored in wing shop (1979); Ground floor X-ray room used to store H-3 exit signs (1990s); contaminated materials removed from Bldg 400 stored awaiting ship-out (1998); radioactive items removed from Bunker 353 stored awaiting ship-out (1999).	Radium paint room 1 st location, rooms 231B, 232C, 234, & stack room surveyed and decontaminated (2001); 2 nd location, rooms 2, 3, 4, 5, and 6, decontaminated (1952); 3 rd location, rooms 223 (A, B, C & D), 227 (A, B, C & D) surveyed (1996) and remediation performed in rooms 223A, 223B, 223C, 227A, 227B & 227C (1998); X-ray room surveyed (1996); Close-out surveys of affected portions of building performed (1998 - 2000).	6.1.1, 6.1.2, 6.1.5, 6.1.7, 6.2.1
Bldg 7	NRMP authorized Ni-63 source in Bldg 7 for use in gas chromatograph (1986). Ni-63 source was lost in 1989. Second Ni-63 source was added to the NRMP in 1995. Ni-63 sources were returned to the vendor in 1996 and 1997 respectively.	All rooms of Bldg 7 were inspected for the lost source in 1989. After sources were returned to the vendor in 1997, 3 rooms and the hallway were surveyed and swipe samples were taken on all survey surfaces. RASO concluded that the building was satisfactory for release. Final regulatory agency concurrence is required.	6.1.4 and 6.2.2
Hangar 12	Work area determined to contain DU (1983); lack of contamination control and waste handling noted (1983, 1985).	Swipe samples collected by RASO (1983) indicated elevated alpha on workbench and floor. Survey performed by RASO (observed by CDHS) (1995); RASO report concluded	6.1.2 and 6.2.3

TABLE 6-1
RADIOLOGICAL SITE INVESTIGATIONS SUMMARY

Building No. or Area	G-RAM Use by NAS	Investigations and surveys performed	Section No.
		that hangar was suitable for unrestricted public use and CDHS concurred.	
Bldg 42	NRC License authorized use of Ni-63 source for gas chromatograph (1981); unit was vented inside the building rather than to the outside as required by the license (1983); license changed to authorize use of Ni-63 sources in Building 7 (1986)	RASO determined radiation level around gas chromatograph less than 0.1 mrem/hr (1983); Because there was no report of source leakage, no final survey was performed when the license was transferred to Building 7 (1986)	6.1.4
Bldg 44	DU counterweight was stored inside building (1979); southeast corner of building had a sign indicating area was used to test radium dials and gauges (1997)	RASO made no specific mention of DU contamination in the building (1979); No surveys of the building were conducted	6.1.2
Bldg 66	Building was possibly the site where two jet engines (e.g., Cs-137, Sr-90, Pu-239) were decontaminated (1951); shop (northeast corner) was used to inspect, store and repair spark-gap irradiators containing Cs-137, UO ₂ , Co-60 or Kr-85 (pre-1977); RASO reported unsafe handling of spark gap irradiator units (1977)	RASO inspected spark gap operation (1977); RASO noted two locations with both alpha and beta-gamma contamination above limits (1980); Ignition shop was surveyed and swipe samples were taken, with no residual radiation being detected (1997); RASO reported that ignition shop meets criteria for release for unrestricted use (1997); No surveys were performed in the main shop where engine decontamination may have occurred.	6.1.3, 6.1.5 and 6.2.4

TABLE 6-1
RADIOLOGICAL SITE INVESTIGATIONS SUMMARY

Building No. or Area	G-RAM Use by NAS	Investigations and surveys performed	Section No.
Bldg 113	Building was possibly the site where two jet engines (e.g., Cs-137, Sr-90, Pu-239) were decontaminated (1951)	No radiation surveys were performed inside the building where decontamination of jet engines may have occurred	6.1.5
Bldg 114	Contaminated piping removed from Building 5 was stored inside the building; storage area was recommended to be surveyed (1995)	No record of surveys being performed, however final status survey should be performed in storage area of the building.	6.1.7
Bldg 309	Building reportedly used for storage of DU counterweights	No record of surveys being performed, however final status survey should be performed in the building.	6.1.2
Bldg 310	New and corroded DU counterweights stored inside (1980); Radioactive (radium) waste stored inside (1983); DU counterweights stored in building and yellowish powder indicative of oxidized uranium was present throughout (1996)	Swipe samples by RASO showed no loose contamination (1980); RASO reported fixed and removable contamination within limits (1983); RASO reported fixed and removable contamination above limits inside the building (1985); Building was surveyed and fixed and removable contamination was found; building was decontaminated, shelves were removed and disposed of and the building was resurveyed for alpha, beta-gamma and loose tritium. All surveys were within limits and RASO concluded the building met the criteria for unrestricted use. Final regulatory agency concurrence is required.	6.1.2 and 6.2.5

TABLE 6-1
RADIOLOGICAL SITE INVESTIGATIONS SUMMARY

Building No. or Area	G-RAM Use by NAS	Investigations and surveys performed	Section No.
Bldg 346	Temporary storage area for radioactive waste and radioactive sources; possible isotopes were Ra-226, DU and Cs-137; Ra-226 sources removed from file cabinet (2005)	No record of surveys being performed, however final status survey should be performed in the building.	6.1.7
Bunker 353	Temporary storage for radiological anomalies, which included Ra-226, Sr-90 and Th-232 (1999); Items were transferred to Bldg 5 (1999); Temporary storage for radioactive material recovered from IR Site 1 during 2004 survey (2005)	Surveyed by two different contractors and verified free of contamination (1999 and 2004); When surveyed for alpha, beta and gamma, areas were found to be at background levels. All stored radioactive material to be removed from the bunker followed by final status survey.	6.1.7 and 6.2.6
Bldg 400	Radium paint facility moved from Bldg 5 (late 1950s); radioactive waste sent to RadShack Area for storage (1973); instruments containing radioluminescent materials were disassembled and radioactive parts were replaced with non-rad parts (1977); radiation work took place in rooms 203 and 204, but amount of radium disposed into sewers and exhaust fan had not been determined (1979); DU counterweights were stored in room 204; some had black oxide corrosion (1979); radium instruments not worked pending completion of new facility (1980);	RASO surveyed items for alpha and beta-gamma radiation (1973); RASO surveys did not find loose alpha contamination (1977); RASO surveys detect loose alpha contamination above the limits (1979); previously used radium facility surveyed and decontaminated (1980); NAS reported 5 rooms (203, 204, 210, 213 and 211/214) as potentially contaminated (1996); Contractor surveyed for alpha (rooms 203 and 204), portions of 203 were above limits, 204 was below limits; rooms 210, 211, 213 and 214 were surveyed, 210 and 213 had contamination and 211 and 214 were below the limits (1996);	6.1.1, 6.1.2, 6.1.3 and 6.2.7

TABLE 6-1
RADIOLOGICAL SITE INVESTIGATIONS SUMMARY

Building No. or Area	G-RAM Use by NAS	Investigations and surveys performed	Section No.
	radium removal operations performed and unlabeled radium waste and materials were stored in the radium removal room (1983, 1985); spark gap irradiator units containing radioactive UO ₂ , Kr-85, Cs-137 or Co-60 were reportedly stored in the building and various rooms suspected to be contaminated with alpha radiation (1996)	Navy contractor performed remediation, including pipe removal, in 1998; radioactive waste was packaged, sent to Bldg 5 and closeout surveys were performed, except ventilation system (1998-2000); survey report concludes that building is suitable for reuse.	
Bunker 497	Suspected special weapons storage with isotopes of concern being U-235 and H-3	Navy contractor performed surveys for alpha, beta and gamma radiation and for the presence of H-3 (1998); RASO conducted confirmation surveys and concluded that the bunker to be releasable for unrestricted use (2000). Final regulatory agency concurrence is required.	6.2.8
IR Site 1	Radium and other industrial waste was delivered directly into the disposal area, also slag from the smelter could have been disposed of therein. Radionuclides of concern: Ra-226, Cs-137, Sr-90, DU, UO ₂ , Th-232 (1943-1956)	Navy contractors performed two manual surveys (1995, 1996); Navy contractors performed 3 rd survey (1998/99) and 4 th survey (2004) which were high-density scan surveys. During 3 rd and 4 th surveys, radioactive anomalies were removed. Soil samples were analyzed for Ra-226 and Sr-90 (2004); Groundwater samples were analyzed for Ra-226 and Sr-90 (2002-2004); Results indicate that remediation is required.	6.1.1, 6.1.6, 6.1.7, and 6.2.9

TABLE 6-1
RADIOLOGICAL SITE INVESTIGATIONS SUMMARY

Building No. or Area	G-RAM Use by NAS	Investigations and surveys performed	Section No.
IR Site 2	Radium and other industrial waste, including infectious and laboratory waste, was delivered directly into the landfill area. Radionuclides of concern: Ra-226, Sr-90, Th-232 (1952-1978); Reportedly, Oak Knoll Hospital, Navy supply Center Oakland and Treasure Island Naval Station disposed of waste daily at the landfill. The landfill also was the site of the RadShack (1973)	Navy contractor performed one manual survey (1995); Navy contractors performed 2 nd survey (1998/99) and 3 rd survey (2004), both of which were high-density scan surveys. During 2 nd survey, radioactive anomalies were removed. Soil samples were analyzed for Ra-226 and Sr-90 (2004); groundwater samples were analyzed for Ra-226 and Sr-90 (2002-2004); Results indicate that remediation is required.	6.1.1, 6.2.10
RadShack Area	Small wooden frame structure located in IR Site 2 received radium contaminated waste in cans, boxes and drums from Building 400, while awaiting pick-up for disposal (1973, 1977, 1980); RadShack reported empty (1983)	RASO survey of soil and soil samples collected at RadShack yielded elevated results (1983); Navy surveyed area, found elevated readings and removed anomalies along with fifteen 55-gallon drums of contaminated soil.	6.1.1, 6.2.6 and 6.2.11
Pier 3	Pier used to dock large Navy ships, nuclear and non-nuclear, had a nine foot section of crane rail, asphalt and concrete contaminated when a Sr-90 deck marker was crushed (1996)	Navy removed and replaced the nine feet of contaminated tracks, asphalt and concrete (1996); Navy contractor surveyed the area and recommended release for unrestricted use (1998-2000). Final Navy and regulatory agency concurrence is required.	6.2.12

TABLE 6-1
RADIOLOGICAL SITE INVESTIGATIONS SUMMARY

Building No. or Area	G-RAM Use by NAS	Investigations and surveys performed	Section No.
Seaplane Lagoon	Radium discharged from Buildings 5 and 400, after traveling through several thousand feet of drain piping emptied into the lagoon (started about 1942);	RASO questioned quantity of radium being discharged into Buildings 5 and 400 drains (1979); Detailed sediment samples were collected from 45 locations in the lagoon and analyzed; radium was detected in 30 samples (1996); UC Berkeley & Battelle Institute collected 20 sediment samples and detected radium (2002); Remediation is required.	6.0, 6.1.1 and 6.2.14
Seaplane Ramp and Parking Apron	Radium contamination of seaplane ramp and parking area was suspected from people working in Building 400 spilling Ra-226 as they traversed from the building to the Seaplane Lagoon.	Navy contractor conducted a 100 percent gamma survey of the area, no radioactive contamination was located (1998); no further action is required.	6.1.15
Former Smelter	Smelter suspected of being used for melting Ra-226 containing components. Slag from smelter was likely disposed of in IR Site 1; by 1954, smelter was gone.	No record of surveys being performed; however a scoping survey should be performed at the site.	6.1.1 and 6.1.6
Storm Drain System and Sanitary Drain System Associated with Bldgs 5 and 400	Based on Navy direction that liquid radium waste be emptied directly into the sewage system, radium was discharged from Building 5 and 400 to the storm drain system and the sanitary drain system.	RASO questioned amount of radium being discharged into the drains in Building 400 (1979); Initial characterization of the radiation in 1,000 feet of drain lines associated with Buildings 5 and 400 conducted using a gamma detector inside the piping (1996); Detailed investigation of 6,000 feet of storm and sanitary drains by	6.1.1 and 6.2.13

TABLE 6-1
RADIOLOGICAL SITE INVESTIGATIONS SUMMARY

Building No. or Area	G-RAM Use by NAS	Investigations and surveys performed	Section No.
		sampling for gamma spectroscopy analyses (1997); Several hundred feet of piping from Building 5 and 400 was replaced/cleaned in place (1998-1999); Based on results to date, further remediation is recommended.	
Alameda Annex	Suspected of being contaminated from equipment stored in the area, principally radium (1994)	Navy contractor surveyed for gamma radiation and found drums of DU and pallets of firebrick (1994); resurveyed and sampled the soil in a 9-acre area (2002); CDHS concurred with release of the scrapyard (2003)	6.1.8
Conex box (shipping container)	Conex box was temporary storage area for radium contaminated piping removed from Building 5 (1990s)	Empty container was surveyed, determined to have fixed contamination and could not be decontaminated. Shipped to a radiological disposal site (1996)	6.1.7

7.0 ASSESSMENT OF IMPACTED SITES

This section describes the methods and definitions used in Section 8.0 to categorize and assess the likelihood of residual contamination at impacted sites, the contaminated media involved, the potential for migration of contamination, and the recommended actions for each impacted site. Evaluations and definitions are based on guidance provided in MARSSIM.

Impacted sites were assessed based on the site's operational history and whether G-RAM was used, stored, or potentially disposed of at the site. Previous site surveys, studies, and investigations, when available, were also used to confirm or expand on the historical information.

Most of the historical radiological surveys and investigations at former NAS were conducted prior to the publication of MARSSIM in December 1997; therefore, the terminology used in this section will not necessarily apply to historical documents. However, the additional radiological investigations that are currently being conducted on former NAS are being conducted following MARSSIM guidelines. The protocols used for these surveys are described below and will be considered for future actions.

7.1 IMPACTED SITES

An impacted site is one that has a potential for radioactive contamination based on historical information or is known to contain radioactive contamination. Areas immediately adjacent to the primary impacted site may be included in this designation. Impacted sites include:

- Sites where radioactive materials were used or stored
- Sites where known spills, discharges, or other unusual occurrences involving radioactive materials have occurred, or may have occurred, that could have resulted in the release or spread of contamination
- Sites where radioactive materials might have been disposed of or buried

7.2 NON-IMPACTED SITES

A non-impacted site is one, based on historical documentation or results of previous radiological survey information, with no reasonable possibility for residual radioactive contamination.

7.3 IMPACTED SITE ASSESSMENTS

Assessments for each impacted site are provided in Section 8.0. These are based on the historical information and site surveys conducted prior to mid-2005. The assessments cover both media and migration pathways. These assessments may change in the future as the result of the implementation of recommended actions or location of additional historical information. The process used to assess the potential radiological contamination at an impacted site is detailed below.

7.3.1 Contamination Potential

The potential for residual radioactive contamination at each impacted site has been determined through a professional evaluation of historical information, previous survey results, and site reconnaissance. As recommended actions continue in the future, these assessments will change. Contamination potentials are categorized as follows:

- **Known-Restricted Access:** Radioactive contamination is known to exist at levels that could require protective clothing, respiratory protection, radiation monitoring, and site access controls
- **Known-Continued Access:** Low levels of contamination exist, but the contamination is contained in a system, fixed on building surfaces, or is in generally inaccessible areas
- **Likely:** Residual radioactive contamination is expected but has not been confirmed
- **Unlikely:** Residual radioactive contamination is not expected but investigation is warranted
- **Unknown:** Residual radioactive contamination potentially exists but no clear indication of possible contamination levels or contaminants has been established
- **None:** Radioactive contamination has been fully assessed and removed, if necessary, and the site has been free-released by the Navy and regulators. The site remains classified as impacted but no further action is required

7.3.2 Contaminated Media

Section 8.0 also categorizes and assesses different types of media at each impacted site that contain, or are suspected of containing, radioactive contamination. Previous survey data, historical information, and professional judgment were used to confirm the presence of contamination or determine contamination potential. Generic terms, as defined in MARSSIM, are used to categorize the types of material that would contain the contamination. For example, if a building contains radioactive contamination in concrete floor materials, the medium would be defined as “structures.” To ensure that all potential media contamination has been evaluated, Section 8.0 includes an assessment for all media categories for each impacted site. The definitions for the types of media that could be contaminated are provided below.

- **Surface Soil:** The top layer of soil (to 6 inches below ground surface [bgs]), fill, gravel, waste piles, concrete, or asphalt that is available for direct exposure, growing plants, resuspension of particles for inhalation, and mixing from human disturbances. This definition includes surface sediment in underwater areas
- **Subsurface Soil:** Solid materials and media found below the surface soils
- **Sediment:** Material that settles to the bottom of a liquid or is deposited by water
- **Surface Water:** Waters found in streams, rivers, lakes, and oceans as well as coastal tidal waters
- **Groundwater:** Waters contained in subsurface materials and aquifers
- **Air:** Atmosphere that becomes a migration pathway for resuspension and dispersal of radioactive contamination and contaminated media
- **Structures:** Man-made surface(s) above the surface or contained within subsurface media
- **Drainage Systems:** Sanitary drains, facility storm drains, or septic systems and leach fields and sediments contained therein. This category can include Bay sediments where drainage to the Bay occurs

7.3.3 Contaminated Media Assessment

Section 8.0 provides an assessment of each contaminated media category at each impacted site. These ratings are determined during the evaluation of each media type. The

ratings may change if additional historical information becomes available or further information is developed during the performance of surveys at the site. Ratings are defined below.

- **High:** Evidence of contamination in the media or migration pathway has been identified
- **Moderate:** The potential for contamination in the media or migration pathway exists, although the extent has not been fully assessed
- **Low:** The potential for contamination in the type of media or migration pathway is remote
- **None:** Evidence of contamination in the specific media or migration pathway has not been found, or known contamination has been removed, and surveys indicate that the media or migration pathway meet today's release criteria

7.3.4 Potential Migration Pathways

Migration pathways are the media or transport mechanisms that allow contamination to spread in the immediate vicinity of the contaminated media or off site. The assessment of each impacted site in Section 8.0 provides an evaluation of the potential migration of radioactive contamination. The type of potential or confirmed contaminated media and the radionuclides of concern were used to assess the potential migration pathways.

7.4 RECOMMENDED ACTIONS

A recommended action for each impacted site is also provided in Section 8.0. The recommendation is the result of the summary investigations conducted to determine radionuclides of concern, contamination potential, contaminated media, and potential migration pathways for exposure. The categories of recommended actions are defined below.

- **Emergency Action:** Immediate remediation or containment is required because the levels of radioactive contamination or radiation exposure are such that there is a high potential for significant exposure or release of radioactive materials to the public or the environment.

- **Scoping Survey:** Historical documentation indicates that radioactive materials may be present at an impacted site that has not had an initial evaluation previously performed, and a survey is required to determine if contamination exists. The intent of these surveys is to identify radionuclide contaminants, relative radionuclide ratios, and general levels and extent of contamination. These surveys usually include minimal surface scans, sampling, and dose rate assessments.
- **Characterization Survey:** Radioactive contamination has been confirmed within an impacted site by a scoping survey, and action must be taken to determine the extent of the contamination and to identify and define the extent of the radionuclides of concern. These surveys include facility or site in-depth surveys, sampling, monitoring, and analysis to provide the basis for acquiring necessary technical information to develop, analyze, and select appropriate cleanup techniques.
- **Remediation:** Radioactive contamination has been fully characterized within an impacted site and remedial or removal action is necessary to comply with site-specific release criteria. Remedial action support surveys are performed while remediation is being conducted to guide the cleanup activities.
- **Final Status Survey:** Historical documentation and previous investigations or remediations indicate that radioactive contamination has been removed from an impacted site, and a survey needs to be conducted in accordance with MARRSIM guidelines to verify that an impacted site complies with applicable site release criteria. This survey includes the appropriate measurements and sampling that will define the radiological condition of a site in preparation for release. The surveys follow completion of decontamination or remediation activities, if any were performed, but can also be conducted to confirm that past radiological activities at an impacted site did not result in residual contamination.
- **Free Release:** Historical documentation and previous investigations and surveys indicate that all applicable release criteria have been met, and the site documentation is ready for review by the Navy and applicable regulators for future non-radiological usage. This may include confirmatory surveys by Navy or regulatory personnel to verify the results reported in the release documentation.
- **No Further Action:** An impacted site has been shown by the Navy and applicable regulatory agencies to meet release criteria.

7.5 MARSSIM SURVEY CLASSIFICATIONS

MARSSIM classifies surveys for impacted sites as Class 1, 2, or 3, depending on the potential for residual contamination. The classification is used to ensure that areas with higher potential for contamination receive a higher degree of survey effort with areas with the greatest potential for contamination receiving Class 1 surveys. The survey classification impacts Final Status Surveys and is instrumental in assessing free release documentation.

The survey classifications will be applied to recommended actions in Section 8.0, where appropriate. As surveys progress and data are analyzed, areas may be reclassified based on newly acquired survey data. For example, if contamination is found during a Class 3 survey, a more extensive Class 1 survey would typically be conducted. The three survey classifications are summarized below. Detailed descriptions are provided in Section 4.3.5.

7.5.1 Class 1 Surveys

Class 1 surveys are recommended for an impacted site that has a high potential for radioactive contamination, is known to have contamination, or had a prior remediation to remove radioactive contamination. This includes areas with contamination in excess of release limits based on a scoping or characterization survey or areas where previous Class 2 or 3 surveys found contamination above the release limits. Class 1 surveys cover 100 percent of the site.

7.5.2 Class 2 Surveys

Class 2 surveys are recommended for an impacted site that has a potential for radioactive contamination but the contamination is not expected to exceed the release limit. This includes areas known to contain minor isolated areas of contamination with low potential for exposure, buffer zones around Class 1 areas, or areas where previous Class 3 surveys found contamination. Class 2 surveys can cover 10 to 100 percent of the site.

7.5.3 Class 3 Surveys

Class 3 surveys are recommended for an impacted site that is not expected to contain residual contamination exceeding the release limit. This includes buffer zones around Class 1 or Class 2 areas or previously decontaminated and surveyed areas. The percentage of the site covered by Class 3 surveys is not standardized, and surveys may be conducted randomly.

7.6 IMPACTED SITE EXAMPLE

A building, formerly used as a research laboratory, is identified as impacted. Undefined contamination has been found on interior building surfaces during a Class 3 scoping survey.

Contamination Potential: Known-Continued Access. The contamination has been confirmed, but there are no indications of hazardous levels.

Potentially Contaminated Media

Surface Soil – Low: There is a slight likelihood that contamination from the building could be in the surface soils immediately surrounding the building.

Subsurface Soil – Low: There is a very slight likelihood that contamination from the surface soils could be in subsurface soils. Depending on the information available at the time of rating and professional evaluation of the information, this potential could be identified as “None.”

Sediment – None: There is not sediment associated with the building.

Surface Water – None: There is no surface water near the laboratory.

Groundwater – None: As the contamination is in the interior of the building, there is no potential for groundwater contamination.

Air – None: Contamination found in the building surfaces is insufficient to cause concern for airborne contamination. This rating is based on the type and level of radioactivity identified and whether the contamination was fixed or loose surface.

Structures – High: Contamination has been identified in the building.

Drainage Systems – High: With surface contamination on the building interior surfaces, there is a significant potential that the drainage systems (primarily sanitary) would be contaminated, as most laboratory rooms contain sink drains.

Migration Pathways for Exposure to the Public or Environment

Surface Soil – Low: The potential contamination in the surface soils would present a low probability for exposure to the public or off-site environment, as there is no probable transport mechanism to cause detectable levels of contamination to spread to off-site locations.

Subsurface Soil – None: There is limited means of initially contaminating subsurface soils; therefore, an exposure to the public or off-site environment is not likely.

Surface Water – None: The information on potentially contaminated media already established that there were no surface waters in the vicinity of the building. Contamination in the interior of a building would require transport of the contamination to surface waters by a secondary method such as runoff to a storm drain system, which is not likely to occur.

Air – None: Low levels of interior building surface contamination would require transport of a significant portion of the contamination outside the confines of the building, and then a secondary mechanism to carry the contamination off site.

Structures – Low to Moderate: Migration of the contamination in the building is likely. However, the potential for contamination to migrate to the public would be dependent on the access and security controls for the building.

Drainage Systems – Low: With contamination on interior building surfaces, the building drainage sanitary system may be contaminated. Low levels in drainage systems would be diluted by flow of non-contaminated liquids from other sources. The exposure potential from this contamination is minimal.

Recommended Actions: Characterization Survey.

8.0 FINDINGS AND RECOMMENDATIONS

This section describes the buildings, structures, and open areas at former NAS that are designated as “impacted” by radiological operations.

8.1 IMPACTED VERSUS NON-IMPACTED SITES

The scope of radiological operations at former NAS has been assessed to determine whether these operations had a direct or indirect effect on buildings, structures, or open areas. These evaluations were based on guidance provided in MARSSIM to define all sites as either “impacted” or “non-impacted” by radiological operations. An impacted site is a site that has or historically had a potential for G-RAM contamination based on the site operating history or known contamination detected during previous radiation surveys.

A summary of the former and current uses of impacted sites is provided in Table 8-1.

A summary of the assessments and recommendations for the impacted sites is provided in Table 8-2.

8.2 SITE ASSESSMENTS

This section provides complete descriptions for each impacted site, including the former and current uses, radionuclides of concern, and previous radiological investigations of the site. This section also categorizes and defines the likelihood of residual contamination at impacted sites, the contaminated media involved, the potential for migration of G-RAM, and the recommended actions for each impacted site using the categories described in Section 7.0. Table 8-2 provides a summary of potential contamination and migration pathway assessments and recommendations for all impacted sites detailed in Section 8.3.

8.3 IMPACTED SITES

Details of each of the potentially impacted sites are provided in Sections 8.3.1 through 8.3.23 and in Tables 8-1 and 8-2.

8.3.1 Building 5



Figure 8-3.1.1 Building 5

Site Description: Building 5 served as the Overhaul and Repair Shop. It was initially constructed in 1940, although it was remodeled and added to many times. In the final configuration Building 5 was over 910,000 ft². The building had very high ceiling to accommodate aircraft and overhead cranes. Multiple mezzanines ran east and west down the center of the building. Radium dial painting facilities were set up in three different locations (as described in Section 6.1.1) in the center section of the mezzanine over the years from 1941 through the mid 1950s (ALA-HRA-56, 58, 60, 72). Surveys have detected radium contamination in several different rooms on the mezzanine. Drain piping from the mezzanine was contaminated by disposal of liquid radium waste. The drain piping was connected directly to the storm drain system on the west side of the building. DU counterweights were handled and stored on the main floor (ALA-HRA-43). Tritium exit signs were stored in the former x-ray room on the first floor (ALA-HRA-82). Figure 8-3.1.2 provides a site plan and Figure 8-3.1.3 provides floor plans of the building.

Former Uses: Aircraft overhaul and repair. Inspection, stripping, repainting of radium instruments. Inspection and handling of DU counterweights. Radioactive waste from

contaminated piping removal and from remediation of IR Site 2 was temporarily stored on the main floor. Radioactive H-3 exit signs were stored in the former x-ray area. As discussed in Section 6.1.5, this building was likely used for disassembly, decontamination and repair of two contaminated aircraft engines.

Current Uses: None, unoccupied.

Radionuclides of Concern: Ra-226, DU, Cs-137, Pu-239, Sr-90, H-3

Previous Radiological Investigations:

Former X-ray room surveyed for H-3 in April 1996 by Allied Technology Group (ALA-HRA-82). The survey of the H-3 storage area was reviewed by RASO who concluded the area met the criteria for release for unrestricted use (ALA-HRA-111). Old bearing shop on mezzanine floor (rooms 223A, B, C, and D, and rooms 227A, B, and C) was surveyed in 1996. Ra-226 contamination was detected on the floor and wall of room 227C. The bearing shop was decontaminated in 1999 (ALA-HRA-113). Closeout surveys of all radium paint facility locations were performed in 1998 through 2000 (ALA-HRA-59).

Contamination Potential: Known-Continued Access: Ra-226 contamination in drain piping under the floor leading to the storm drain system on the west side of the building.

Likely: Ventilation ducting leading from the center portion of mezzanine to exhaust locations outside the building.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: High

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: Moderate

Recommended Actions: a. Final Status Surveys of the radium paint shop rooms on the mezzanine.

b. Remediation of the drain piping inside Building 5 leading out to the storm drain.

c. Scoping Survey of ventilation and exhaust ducting from former radium paint rooms.

d. Scoping survey of main floor for DU.

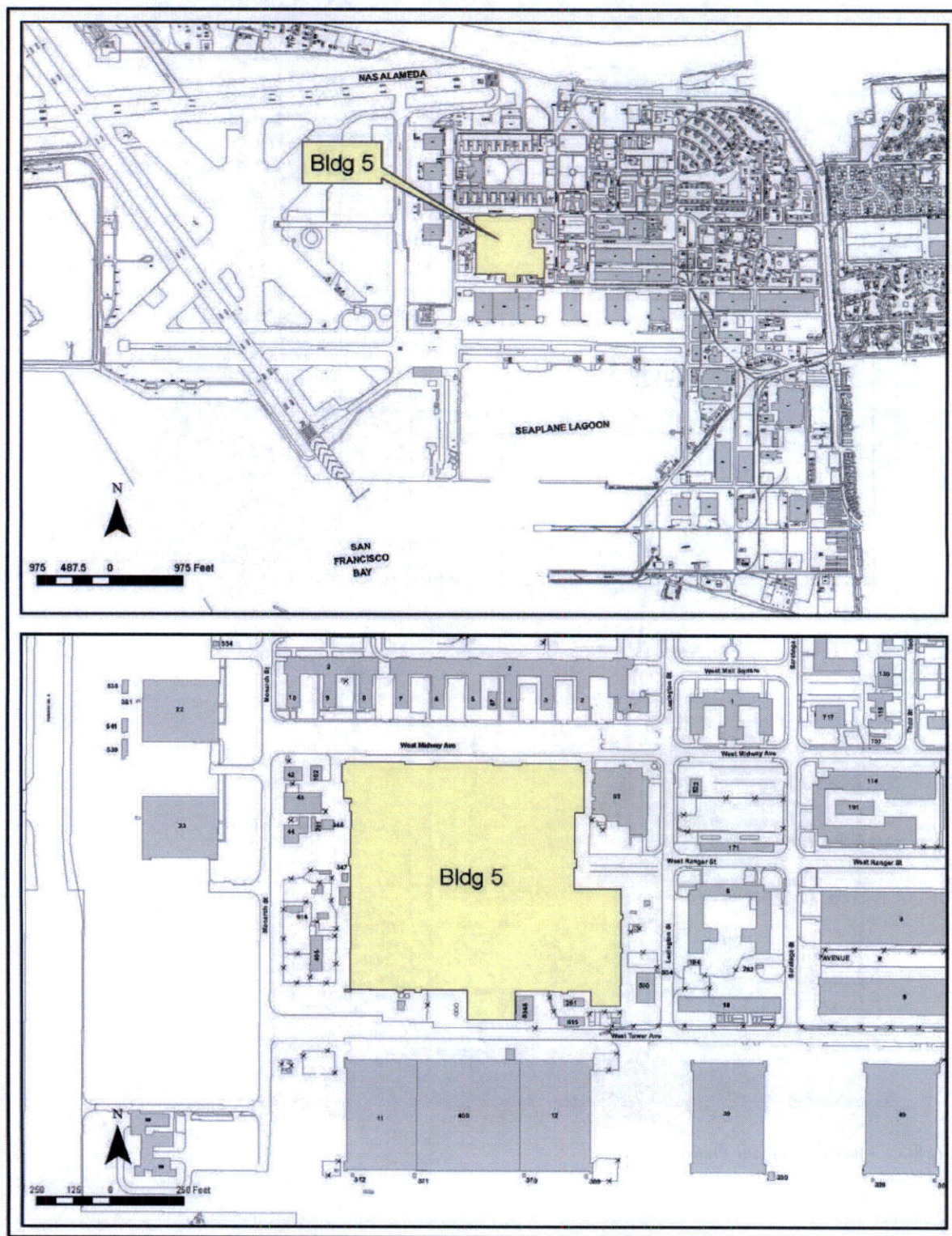


Figure 8-3.1.2 Building 5 Location

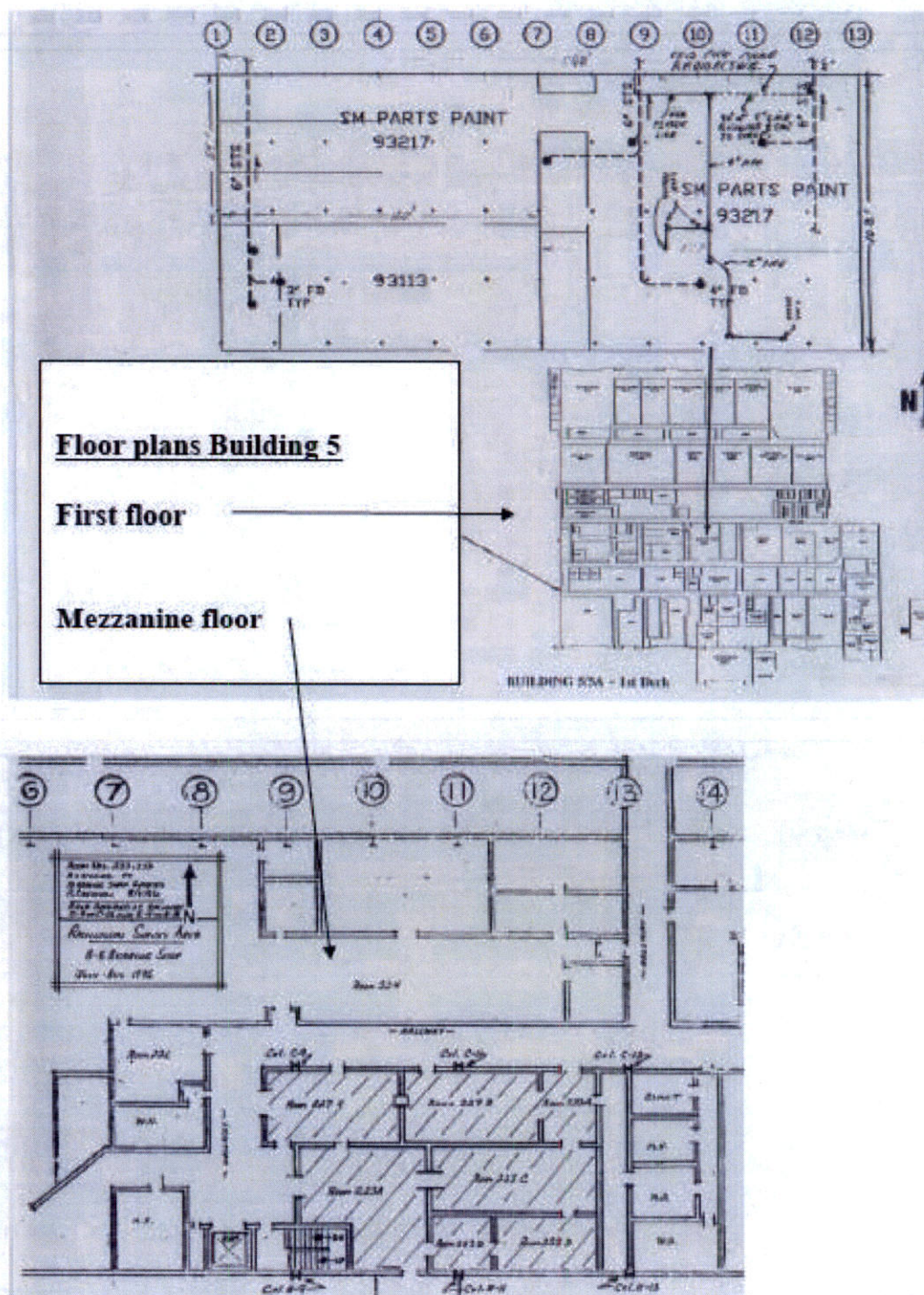


Figure 8-3.1.3 Building 5 Floor Plans

8.3.2 Building 7



Figure 8-3.2.1 Building 7

Site Description: Building 7 is a two-story concrete structure built in 1985. This building served as the Material Engineering Laboratory from 1985 until base closure. Two gas chromatograph units were installed on the second floor. NRC Material License 04-19811-01 was issued for possession of Ni-63 sources utilized with the gas chromatographs (ALA-HRA-37). One of the Ni-63 sources was lost in 1989 (ALA-HRA-88). The source was last seen in a cabinet on the second floor of Building 7. It was never recovered. A replacement source was obtained. Records indicate one gas chromatograph was used in Room 212, and the source for one unit was stored in room 205 (ALA-HRA-94). During base closure operations, the Ni-63 source for one gas chromatograph unit was transferred to the vendor in 1996. The second source, for the other unit, was transferred to the vendor in 1997. Wipe tests were performed on both sets of Ni-63 sources before transfer back to the vendor were negative (ALA-HRA-92 and 93). The wipe tests confirmed that neither of the source sets was leaking. Figure 8-3.2.2 provides a site plan.

Former Uses: Gas chromatographs using Ni-63 sealed sources

Current Uses: Leased

Potential Radionuclides of Concern: Ni-63

Previous Radiological Investigations: A 1997 survey of three rooms and hallway on the second floor resulted in no detectable contamination (**ALA-HRA-95**). The storage room for one of the Ni-63 sources was not surveyed.

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures Site Description: None
Drainage Systems: None

Recommended Actions: Free Release is pending regulatory agency review and concurrence.

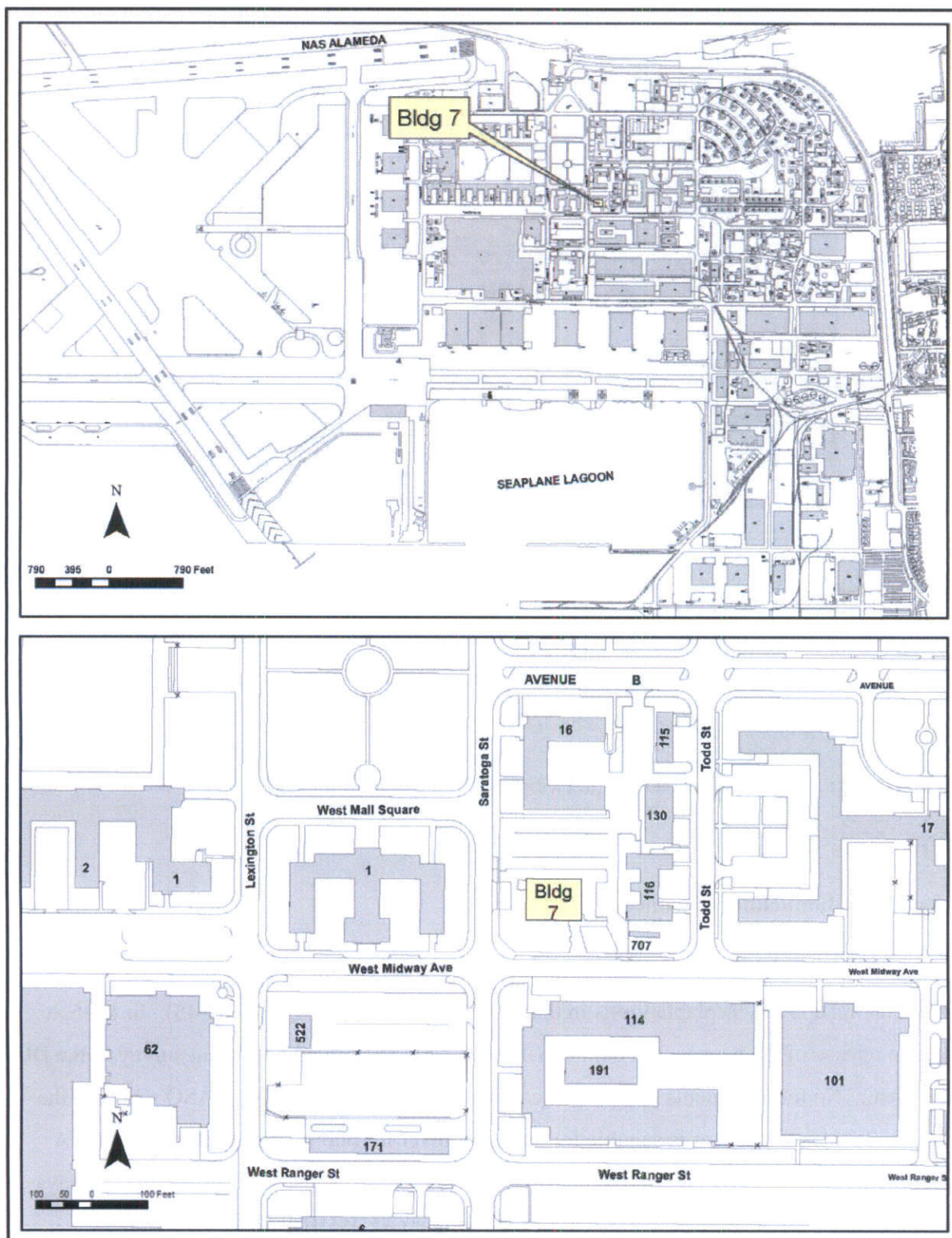


Figure 8-3.2.2 Building 7 Location

8.3.3 Hangar 12



Figure 8-3.3.1 Hangar 12

Site Description: Hangar 12 is a steel and concrete aircraft hangar. It was built in 1941 as the aircraft rework shop. The hangar covers approximately 110,000 ft². A small area in the northeast corner was roped off and used for inspection of DU counterweights. Figure 8-3.3.2 provides a site plan.

Former Uses: Inspection of DU counterweights.

Current Uses: Vacant

Potential Radionuclides of Concern: DU

Previous Radiological Investigations: In 1983, a RASO Technical Assistance visit detected contamination above acceptable limits in the DU inspection area (ALA-HRA-45). In 1995, to expedite release of the hangar for commercial use, RASO performed a closeout survey in the DU work area. No measurements exceeded the guideline levels for DU. The RASO report of the survey concludes the hangar is suitable for direct turnover for public use (ALA-HRA-83). A representative of the CDHS observed the RASO survey, performed some confirmation surveys, and concurred with the unrestricted release of the hangar (ALA-HRA-84).

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: No Further Action; released by RASO and CDHS.

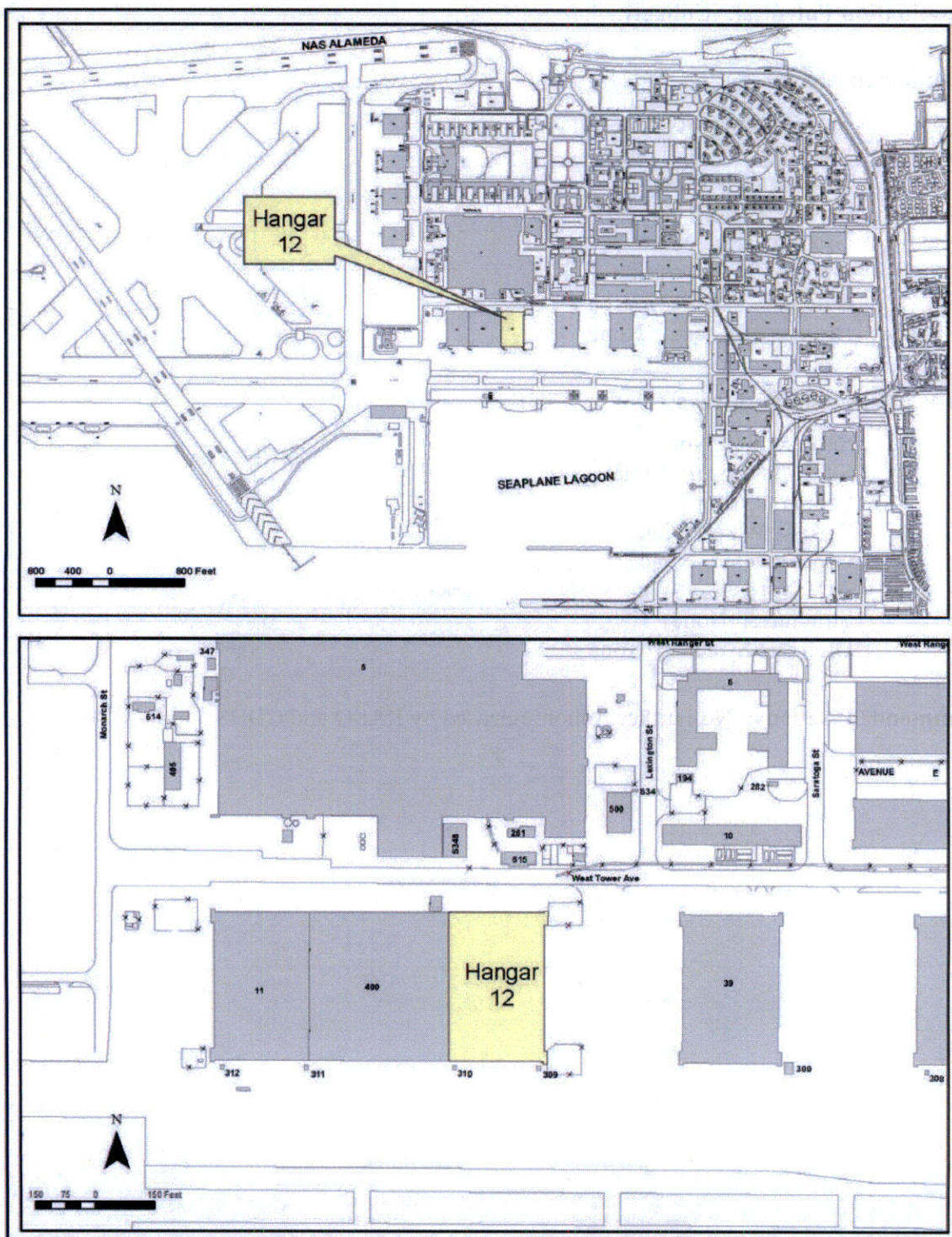


Figure 8-3.3.2 Hangar 12 Location

8.3.4 Building 42



Figure 8-3.4.1 Building 42

Site Description: Concrete one-story building. Building 42 was constructed in 1941 and was the Engineering Laboratory until replaced by Building 7 in 1985. This building of approximately 3,000 ft² was the original location for the Ni-63 gas chromatograph. The NRC Material License 04-19811-0 was initially issued for possession of Ni-63 sources in Building 42 (ALA-HRA-37). The NRC license was transferred to Building 7 in 1986. The NRC license was converted to an NRMP in 1987 (ALA-HRA-38). Note: Leak tests of Ni-63 sources in Building 7 in 1996 and 1997 were negative (ALA-HRA-92 and 93). Figure 8-3.4.2 provides a site plan.

Former Uses: Engineering Laboratory.

Current Uses: Commercial caterer.

Potential Radionuclides of Concern: Ni-63

Previous Radiological Investigations: None identified

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None

Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: No Further Action. Only sealed small quantity sources with no history of leakage were used in this building.

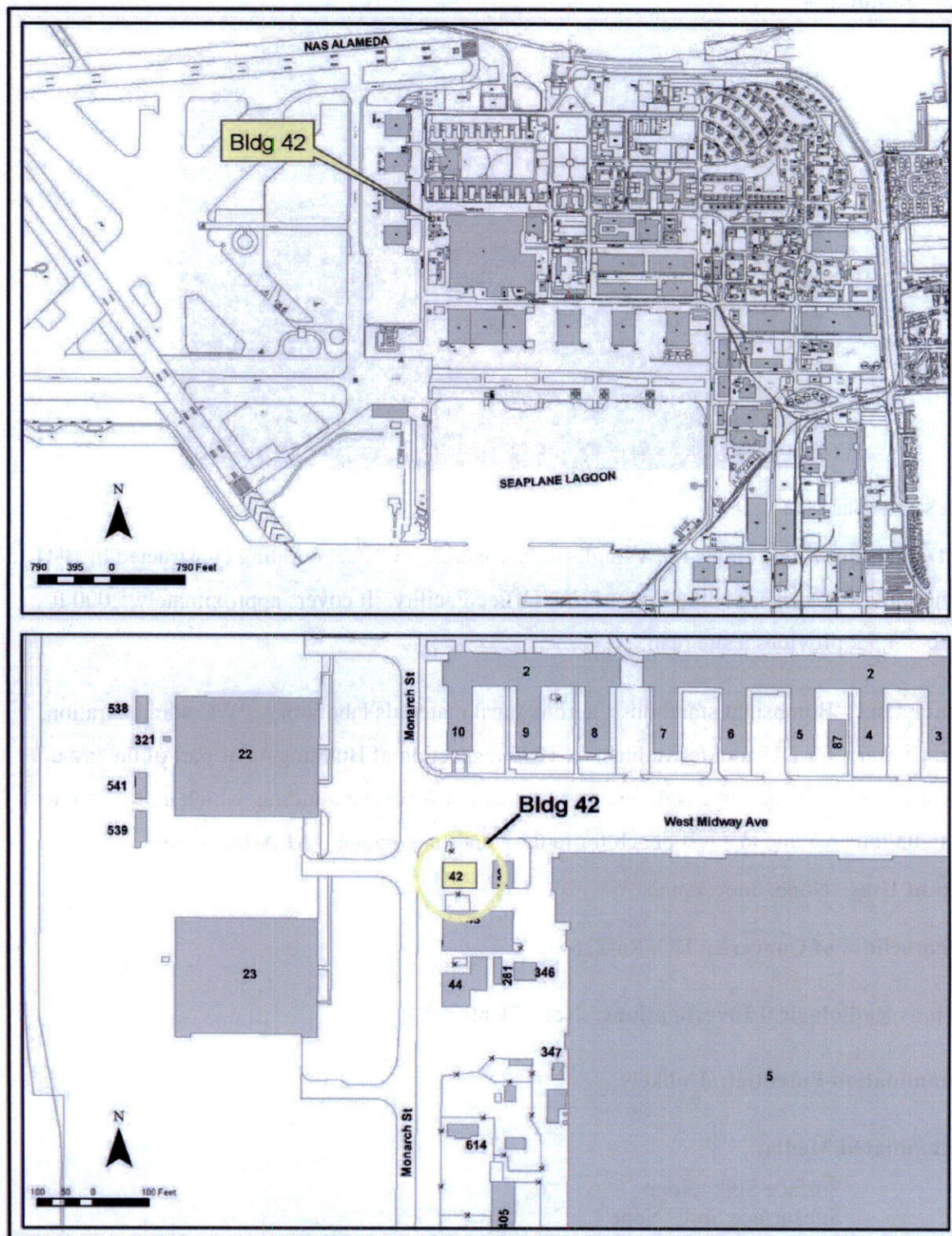


Figure 8-3.4.2 Building 42 Location

8.3.5 Building 44



Figure 8-3.5.1 Building 44

Site Description: Building 44 is a single-story concrete and steel building constructed in 1941. The building was originally the Engineering Office Facility. It covers approximately 5,000 ft². Figure 8-3.5.2 provides a site plan.

Former Uses: Bombsight storehouse, aeronautical materials laboratory, PWC administration, interim storage for DU counterweights. A 1997 inspection of Building 44 as part of the lay-up process identified a sign on a wall on the southeast corner of the building, which indicates it to be a radiation area due to a test bench for radium dials and gauges (ALA-HRA-80).

Current Uses: None, unoccupied.

Radionuclides of Concern: DU, Ra-226

Previous Radiological Investigations: None identified.

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None

Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: Characterization Survey.

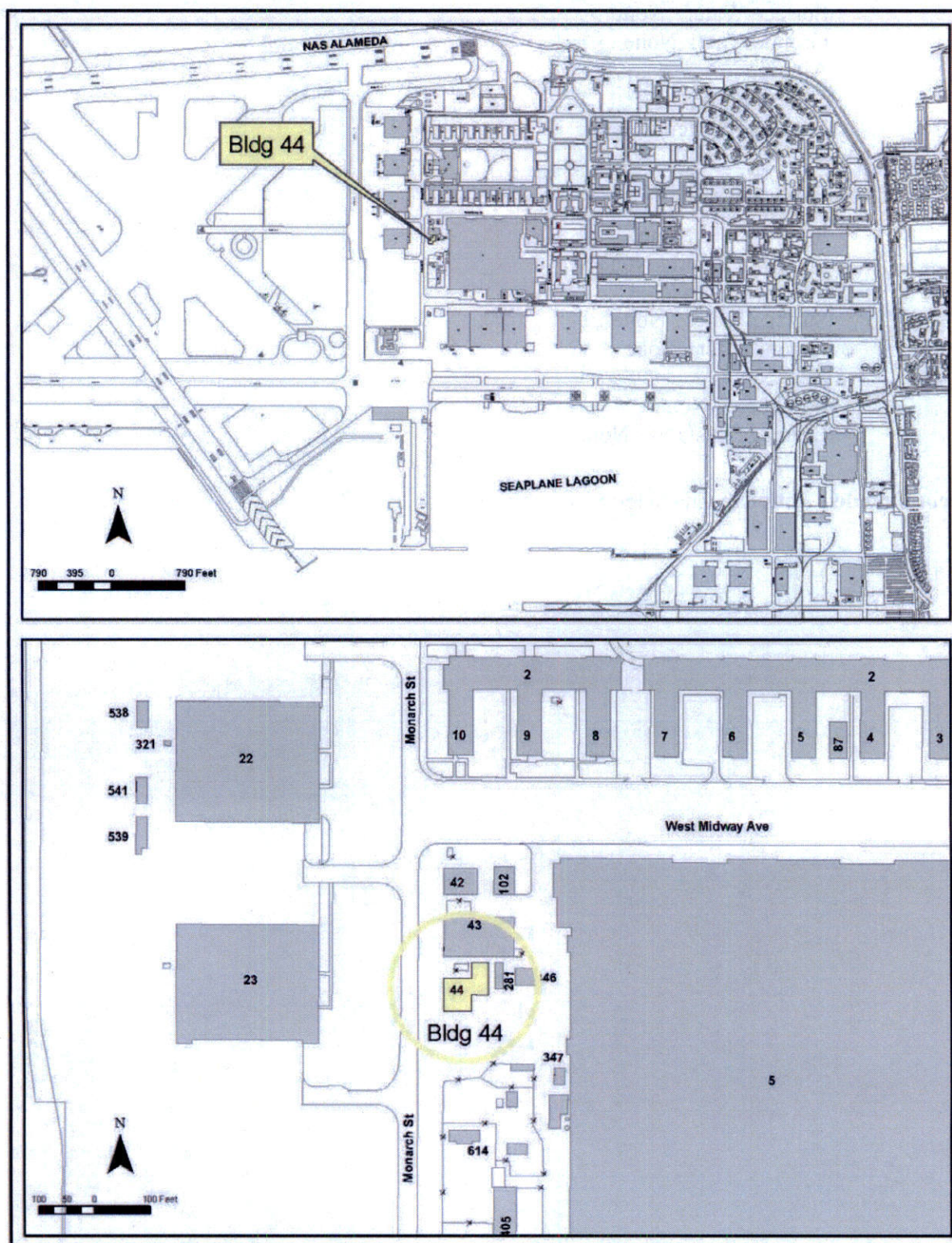


Figure 8-3.5.2 Building 44 Location

8.3.6 Building 66



Figure 8-3.6.1 Building 66

Site Description: Building 66 is a single-story concrete and steel structure built in 1942. The one-story high bay building covers approximately 31,000 ft². There are two small mezzanine areas above the main floor. Figure 8-3.6.2 provides a site plan.

Former Uses: Aircraft overhaul, jet engine overhaul facility, engine accessory test shop. Ignition shop was used for work on spark gap irradiators containing radioactive materials. Building 66 is one of three facilities that may have been the site for decontamination and overhaul of two contaminated aircraft engines in 1951. A RASO Technical Assistance Visit in 1980 detected two locations in the Ignition Shop with alpha and beta-gamma contamination (ALA-HRA-44).

Current Uses: Leased as a rigging shop.

Potential Radionuclides of Concern: Cs-137, Pu-239, Sr-90, Co-60, Kr-85 and UO₂.

Previous Radiological Investigations: Ignition shop was surveyed in 1997 (ALA-HRA-85). No residual radioactivity identified. RASO review of the survey of Building 66 concluded that the building meets the criteria for release (ALA-HRA-86). No surveys were performed in the

main floor of the building where contaminated jet engine decontamination might have taken place.

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: a. Main floor -Characterization Survey for evidence of isotopes associated with aircraft engine decontamination.

b. Ignition (spark gap irradiator) Shop - Free Release pending regulatory review and concurrence.

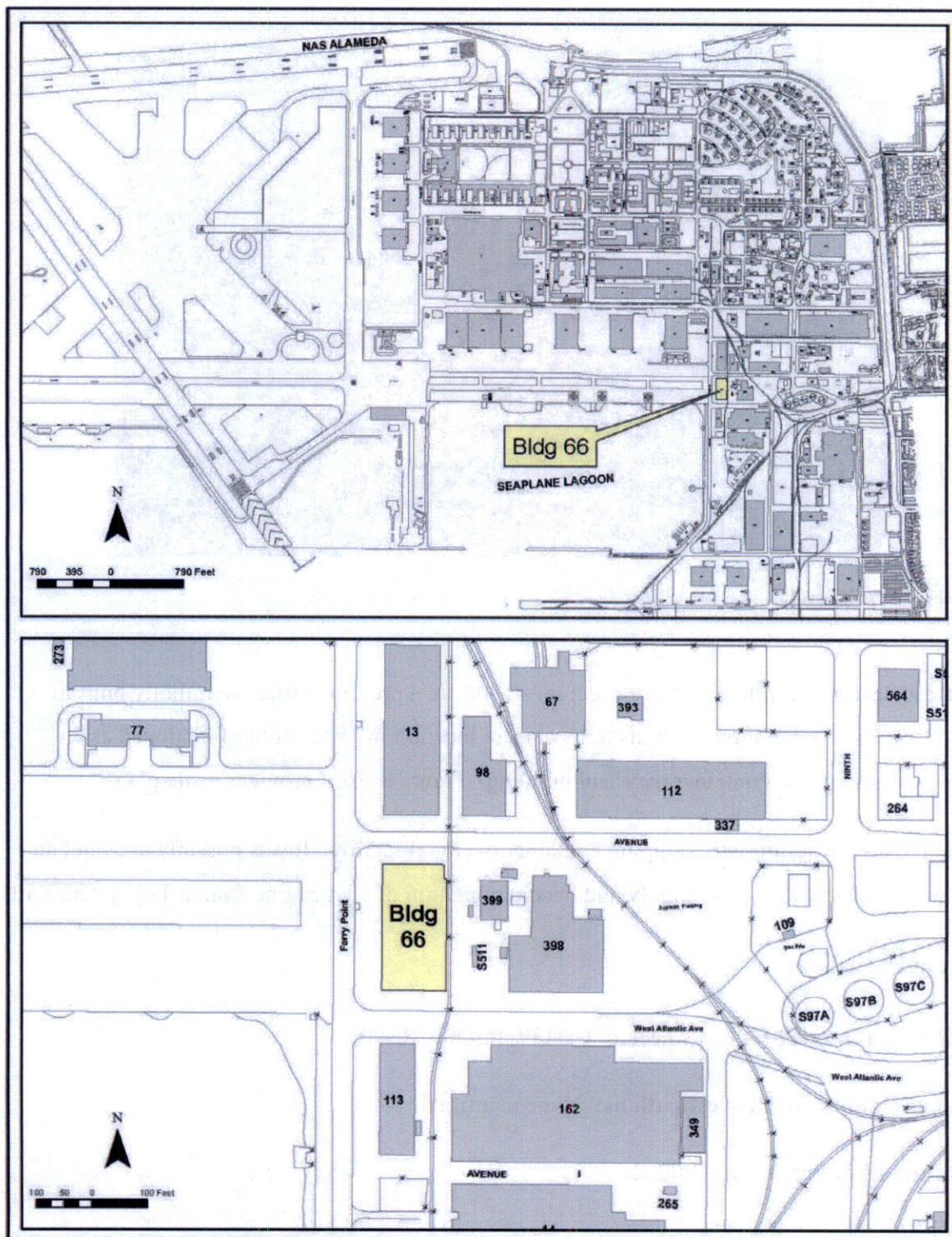


Figure 8-3.6.2 Building 66 Location

8.3.7 Building 113



Figure 8-3.7.1 Building 113

Site Description: Building 113 is a sheet metal and steel pre-built structure initially built in 1943. It was moved in three sections to its current location in 1948. It has functioned as an aircraft parts shipping container overhaul building. Figure 8-3.7.2 provides a site plan.

Former Uses: Aircraft parts shipping container overhaul facility. It was possibly used in late 1951 as the location for disassembly and decontamination of a jet engine from a T-33 jet aircraft.

Current Uses: None.

Potential Radionuclides of Concern: Cs-137, Pu-239, Sr-90

Previous Radiological Investigations: None identified.

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: Characterization Survey

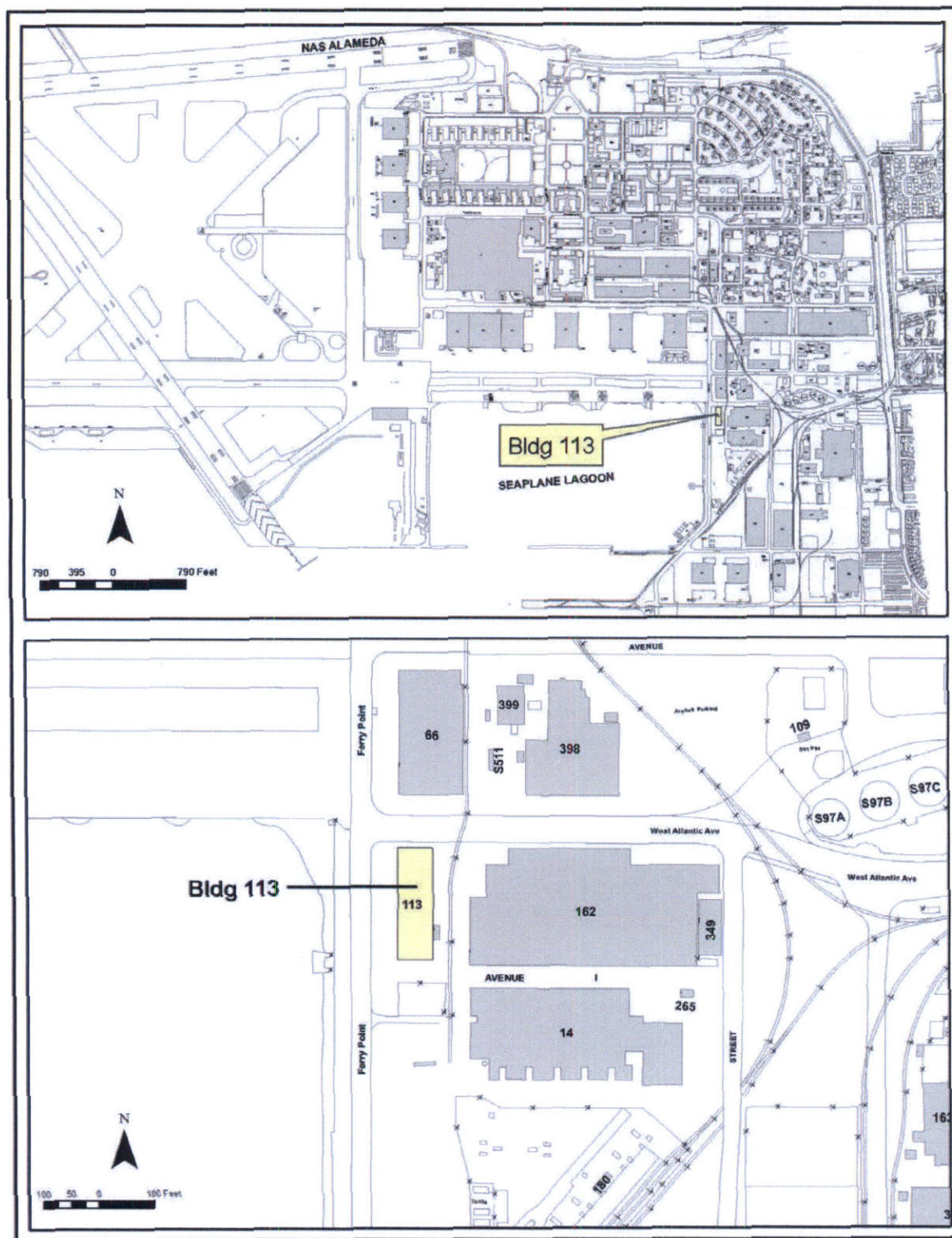


Figure 8-3.7.2 Building 113 Location

8.3.8 Building 114



Figure 8-3.8.1 Building 114

Site Description: Building 114 is an approximately 77,000 ft² facility constructed in 1944. Figure 8-3-8.2 provides a site plan.

Former Uses: Public Works office, maintenance shop, appliance repair, Naval Audit Service, temporary storage of contaminated piping removed from Building 5 (ALA-HRA-104). The exact location used for temporary storage of the pipe within the Building 114 complex was not identified.

Current Uses: Partially occupied by Resident Officer in Charge of Construction.

Potential Radionuclides of Concern: Ra-226.

Previous Radiological Investigations: None identified.

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: Characterization Survey in all areas within the Building 114 complex ground floor that could have been used for temporary storage of a dumpster containing the sections of piping removed from Building 5.

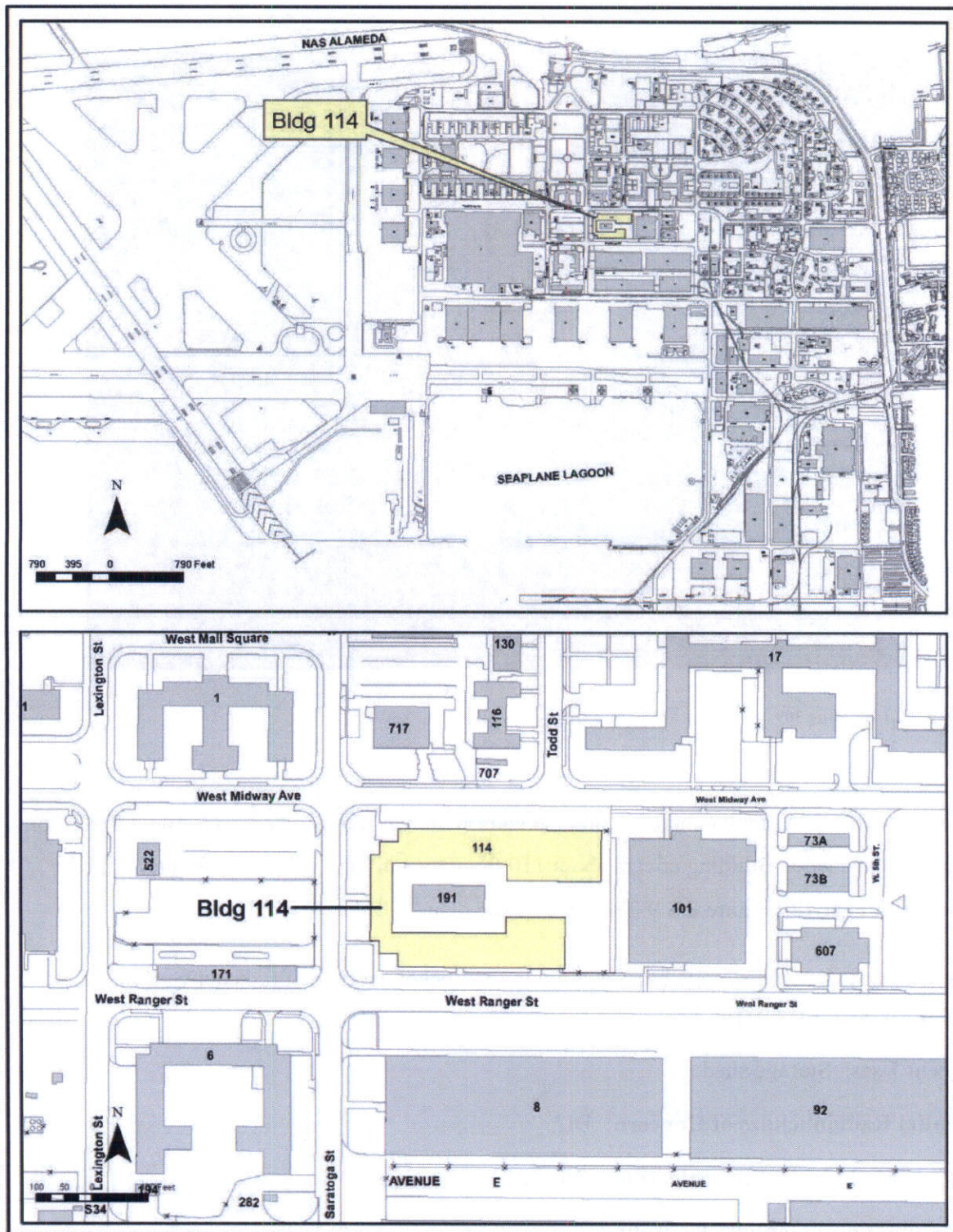


Figure 8-3.8.2 Building 114 Location

8.3.9 Building 309



Figure 8-3.9.1 Building 309

Site Description: A small concrete storage bunker with two rooms on one side and a third room on the opposite side. Building covers about 110 ft². This building is located on the southeast corner of Hangar 12. Figure 8-3.9.2 provides a site plan.

Former Uses: General storage bunker, ammunition locker, storage of radioactive DU counterweights (ALA-HRA-81).

Current Uses: Storage shed.

Potential Radionuclides of Concern: DU.

Previous Radiological Investigations: None.

Contamination Potential: Unlikely

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: Characterization Survey

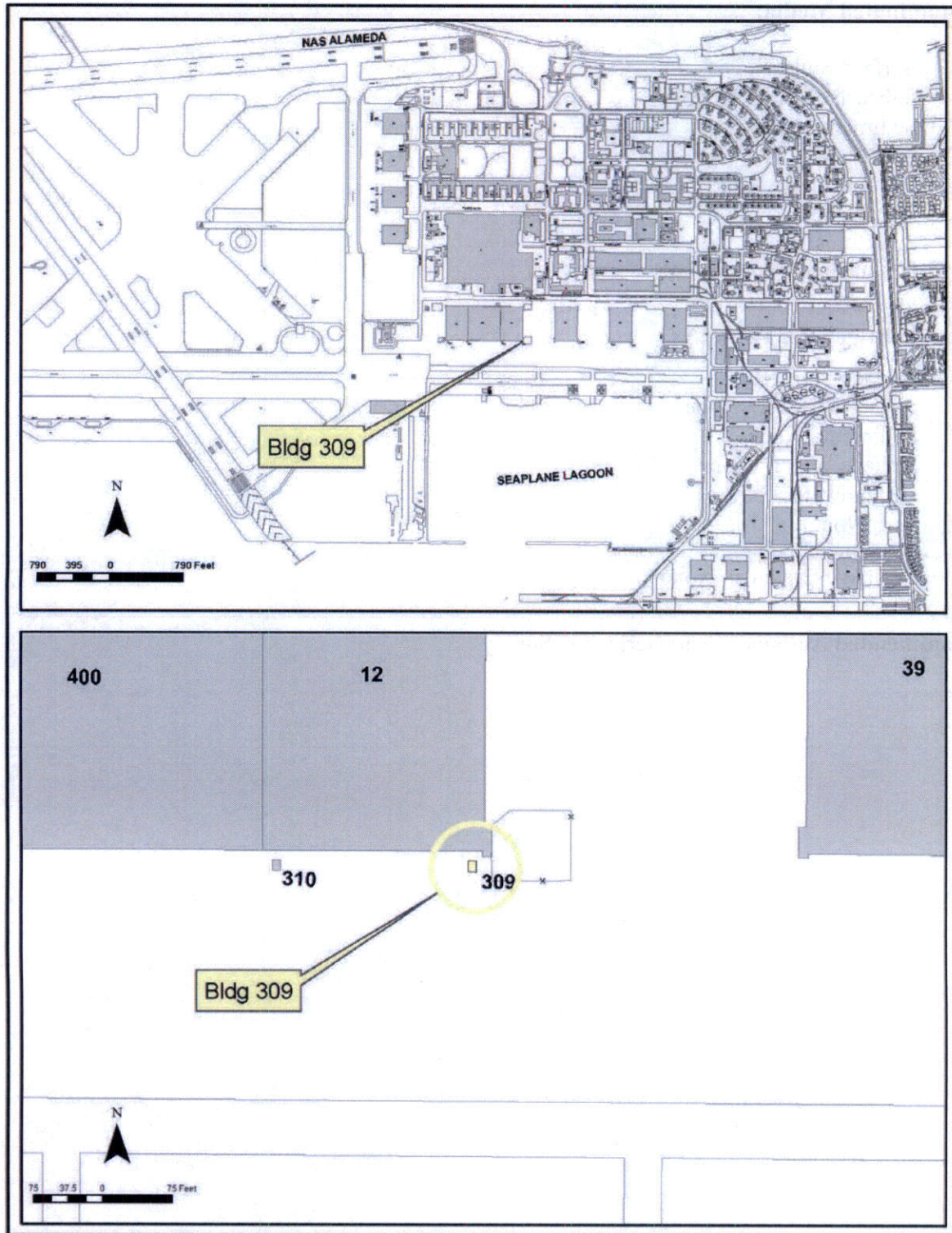


Figure 8-3.9.2 Building 309 Location

8.3.10 Building 310



Figure 8-3.10.1 Building 310

Site Description: A small concrete storage bunker with two rooms on one side and a third room on the opposite side. Building covers about 110 ft². This building is located on the southeast corner of Building 400. Figure 8-3.10.2 provides a site plan.

Former Uses: General storage bunker, ammunition locker, storage of radioactive materials (DU and Ra-226 instruments) (ALA-HRA-44, 45, 46).

Current Uses: Storage shed.

Potential Radionuclides of Concern: Ra-226, DU.

Previous Radiological Investigations: In a 1996 survey of the bunker, powder indicative of oxidized uranium was present throughout the storage bunker. The floors, walls and storage shelves were all contaminated with removable contamination. The entire building was decontaminated. Resurveys still indicated both fixed and removable contamination on the storage shelves. The storage shelves were removed and cut up and disposed of as waste. Final surveys of the building met the criteria of the NRC Guide 1.86 (ALA-HRA-82). RASO review

of the Building 310 survey concluded the building meets the criteria for release for unrestricted use (ALA-HRA-111).

Contamination Potential: Unlikely

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: Free Release is pending final Navy and regulatory agency review and concurrence.

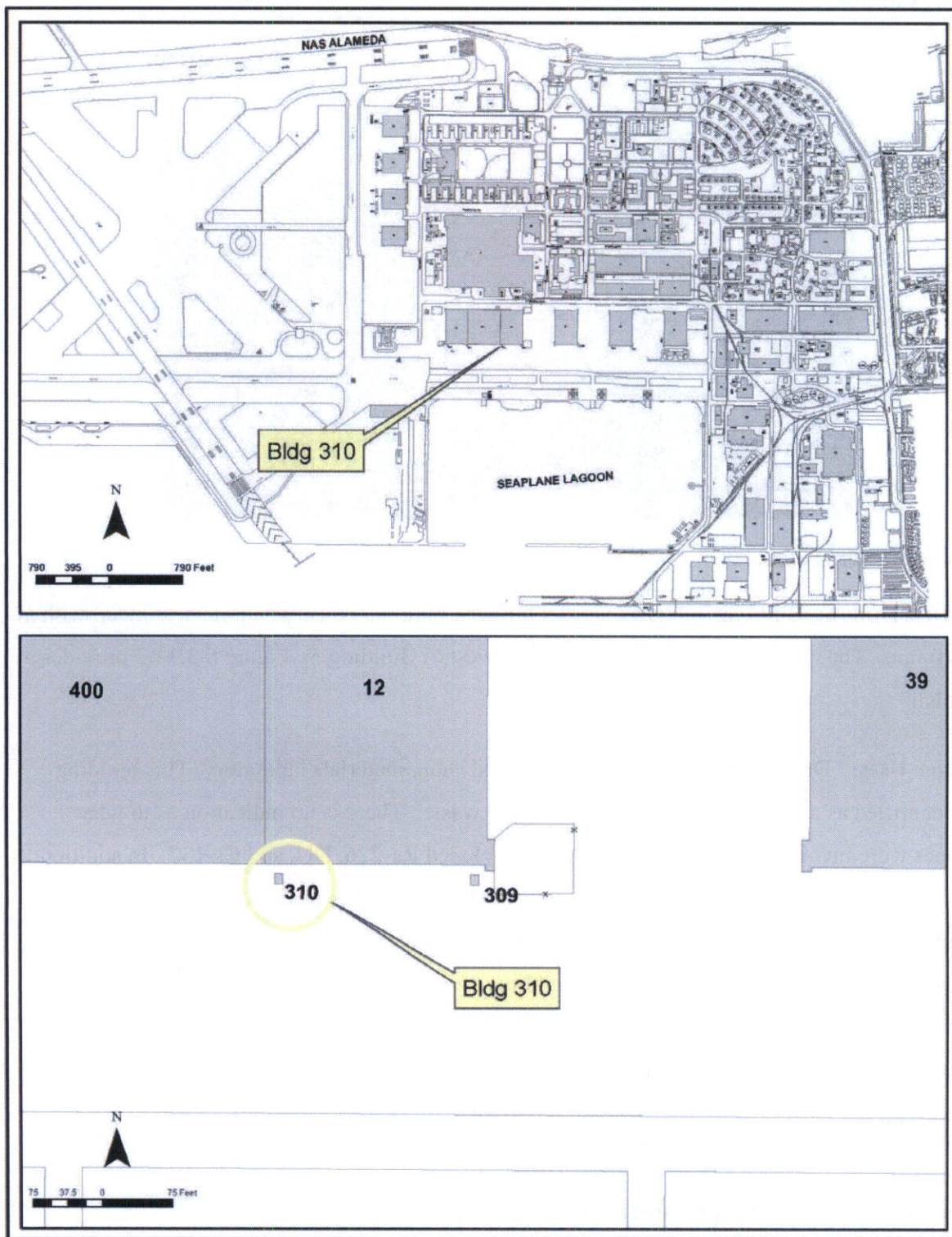


Figure 8-3.10.2 Building 310 Location

8.3.11 Building 346



Figure 8-3.11.1 Building 346

Site Description: Building 346 is a Quonset hut type building constructed of sheet metal with a steel frame. The building is located immediately west of Building 5. Figure 8-3.11.2 provides a site plan.

Former Uses: Drop Tank cleaning shop, electrical shop, materials laboratory. This building was identified as a storage building for radioactive waste. There is no indication as to what isotopes were involved, but it is likely that they included Ra-226, DU, and Cs-137. In addition to being a temporary storage area for radioactive waste, this building was also the equipment storage building for at least one contractor performing radiological work at former NAS. Radioactive Ra-226 sources stored in the building were removed by the contractor from a file cabinet in the building in mid-2005. After removal the sources were wipe tested and verified to be intact (not leaking) (ALA-HRA-106).

Current Uses: None, unoccupied.

Potential Radionuclides of Concern: Ra-226, DU, Cs-137.

Previous Radiological Investigations: Modified Class 1 and Class 2 surveys performed in 1999. No anomalous activities identified (**ALA-HRA-105**).

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: Final Status Survey.

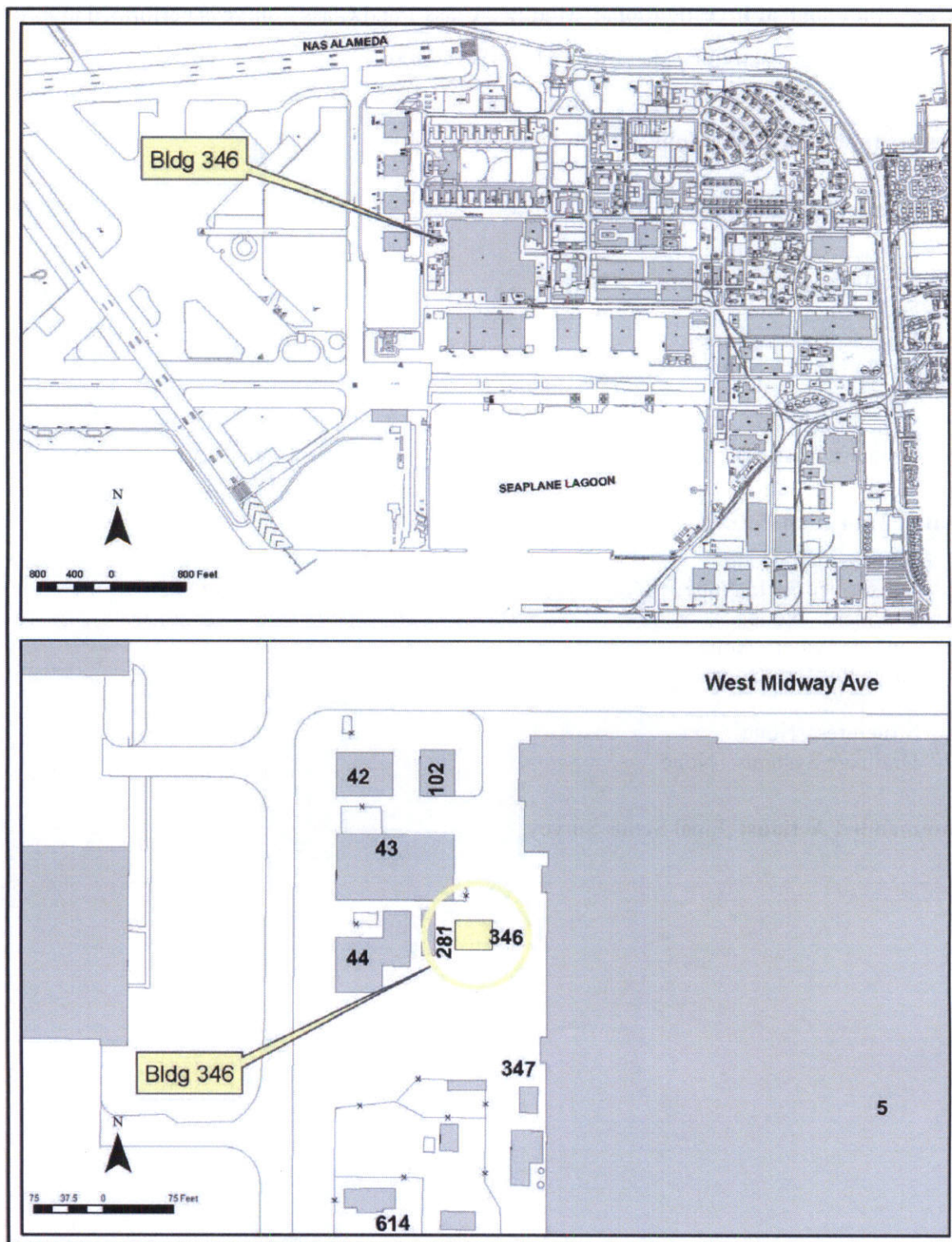


Figure 8-3.11.2 Building 346 Location

8.3.12 Bunker 353

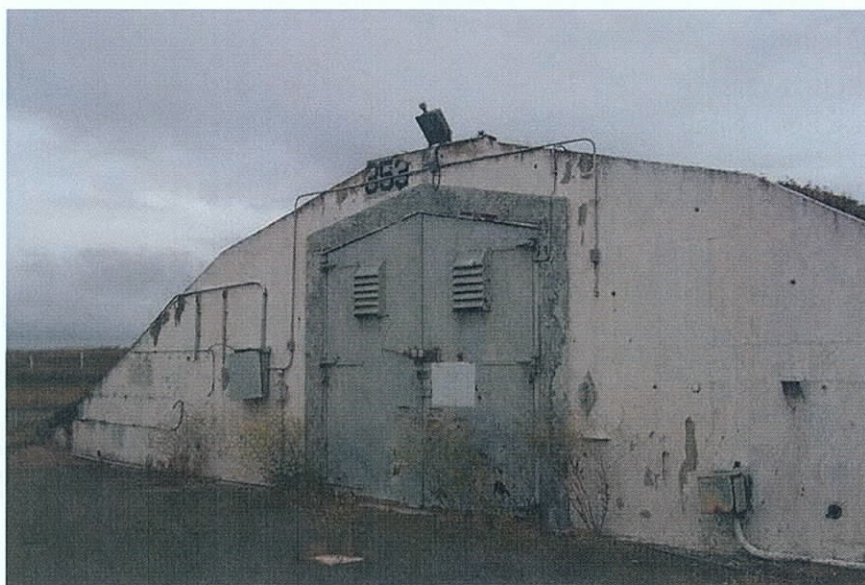


Figure 8-3.12.1 Bunker 353

Site Description: High explosives magazine constructed in 1952. Inside surface covers approximately 1,400 ft². Figure 8-3.12.2 provides a site plan.

Former Uses: Storage of high explosives. Temporary storage of radioactive anomalies removed from IR Site 2 in 1998/1999 (ALA-HRA-107). Temporary storage of anomalies removed from IR Site 1 in 2004 (ALA-HRA-74).

Current Uses: In use as a temporary storage area for radioactive material (2005).

Potential Radionuclides of Concern: Ra-226, Sr-90, Th-232.

Previous Radiological Investigations: Surveyed in 1999 following use as a temporary storage area for radioactive anomalies and contaminated soil removed from IR Site 2 (ALA-HRA-107). No contamination was detected. The bunker was surveyed in 2004 prior to being used as a temporary storage area for anomalies removed during the 2004 high-density survey of the IR sites. No contamination detected (ALA-HRA-74).

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: None

Recommended Actions: a. Remove all stored radioactive material from the bunker.

b. Final Status Survey.

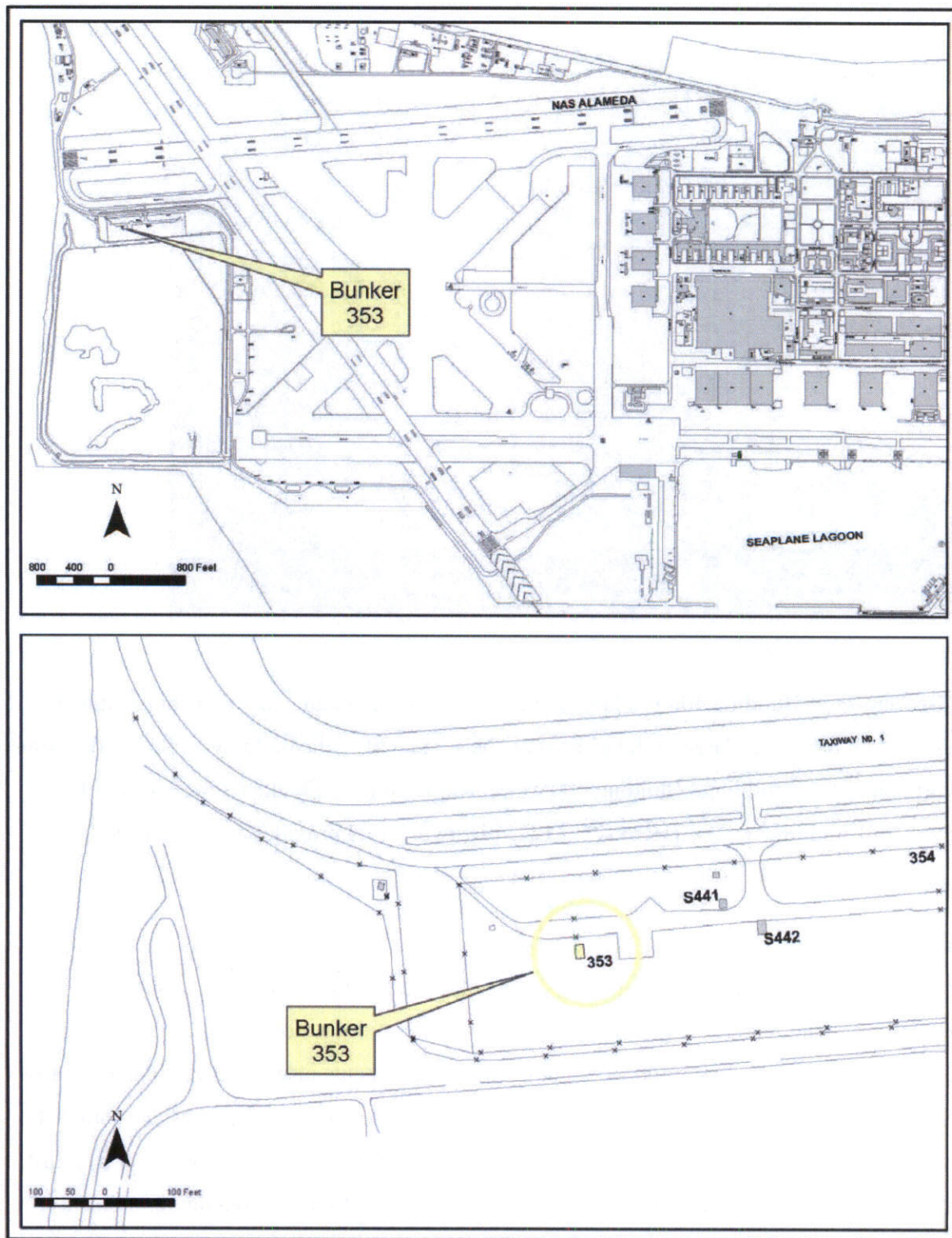


Figure 8-3.12.2 Bunker 353 Location

8.3.13 Building 400



Figure 8-3.13.1 Building 400

Site Description: Building 400 is a large concrete and steel structure covering approximately 257,000 ft². It has a very large high bay area on the south half of the building and three floors on the north half of the building. Building 400 was constructed in 1957 and assumed some of the functions of Building 5 (ALA-HRA-126, 112). Figure 8-3.13.2 provides a site plan and Figure 8-3.13.3 provides a floor plan of the second floor.

Former Uses: Avionics building. Missile rework facility. Applied instruments building, aircraft rework shop, non-metal components shop, electrical components shop, electronic systems components, support equipment calibration. Second floor rooms 203, 204, 210, 211, 213, and 214 were in use in support of radium painted instruments inspection and repair as early as 1959 (exact date unknown) (ALA-HRA-125). A small un-numbered room inside room 204 also served as a storage area for DU counterweights (ALA-HRA-73). Some rooms on the third floor were also used for storage or handling of spark gap irradiator units containing radioactive (Cs-137, Co-60, Kr-85 and/or UO₂) material (exact location unknown) (ALA-HRA-87).

Current Uses: In-use as an industrial facility.

Potential Radionuclides of Concern: Ra-226, DU, Cs-137, Co-60, UO₂ and Kr-85

Previous Radiological Investigations: In 1996, the rooms on the second floor of Building 400 suspected of contamination were surveyed for alpha. Alpha contamination above the release limits was present on portions of a workbench in room 203. No alpha contamination was noted in room 204. On the south side of the second floor, rooms 210, 211, 213, and 214 were surveyed (ALA-HRA-113). Two workbenches and a large cabinet in room 210; and a workbench in room 213 were found to contain alpha contamination. The contaminated items were transferred to Building 5 for storage and subsequently were disposed at an approved radioactive waste disposal site. In addition to equipment, the sinks and drain lines in rooms 211 (men's restroom) and 214 (women's restroom) were surveyed. No alpha contamination was noted (ALA-HRA-116). In a separate survey, alpha contamination was detected at several locations in room 204 and on the floor in room 210 (ALA-HRA-112). Remediation of rooms 203, 204, 210, 211, 213, and 214 was performed in 1998/1999 (ALA-HRA-113). Between October 1998 and April 2000, closeout surveys of the affected portions of Building 400 were completed. Surveys were Class 1, Class 2 or Class 3 as defined by MARSSIM. The level of survey was determined based on the previous contamination history. The survey report indicates that for Class 1 areas "Where air exhaust ducts are present, the ducts were swiped." No data for swipe survey results in Building 400 are included in the survey report. The survey report concludes that the Building 400 is suitable for reuse in accordance with application of MARSSIM survey technology (ALA-HRA-59). Survey documentation does not indicate that the building ventilation system or exhaust system were included in the surveys discussed herein. These areas should be investigated. In addition, there are no records of surveys on the third floor of the building.

Contamination Potential: Likely

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None

Surface Water: None
Groundwater: None
Air: None
Structures: Low
Drainage Systems: Low

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: Low

Recommended Actions: a. Perform Final Status Surveys of the radium paint shop rooms and the DU room on the second floor.

b. Perform Remediation of the drain piping inside Building 400 leading out to the sanitary drain.

c. Perform Characterization Surveys of ventilation and exhaust ducting from former radium paint rooms.

d. Perform Characterization Survey of the third floor.

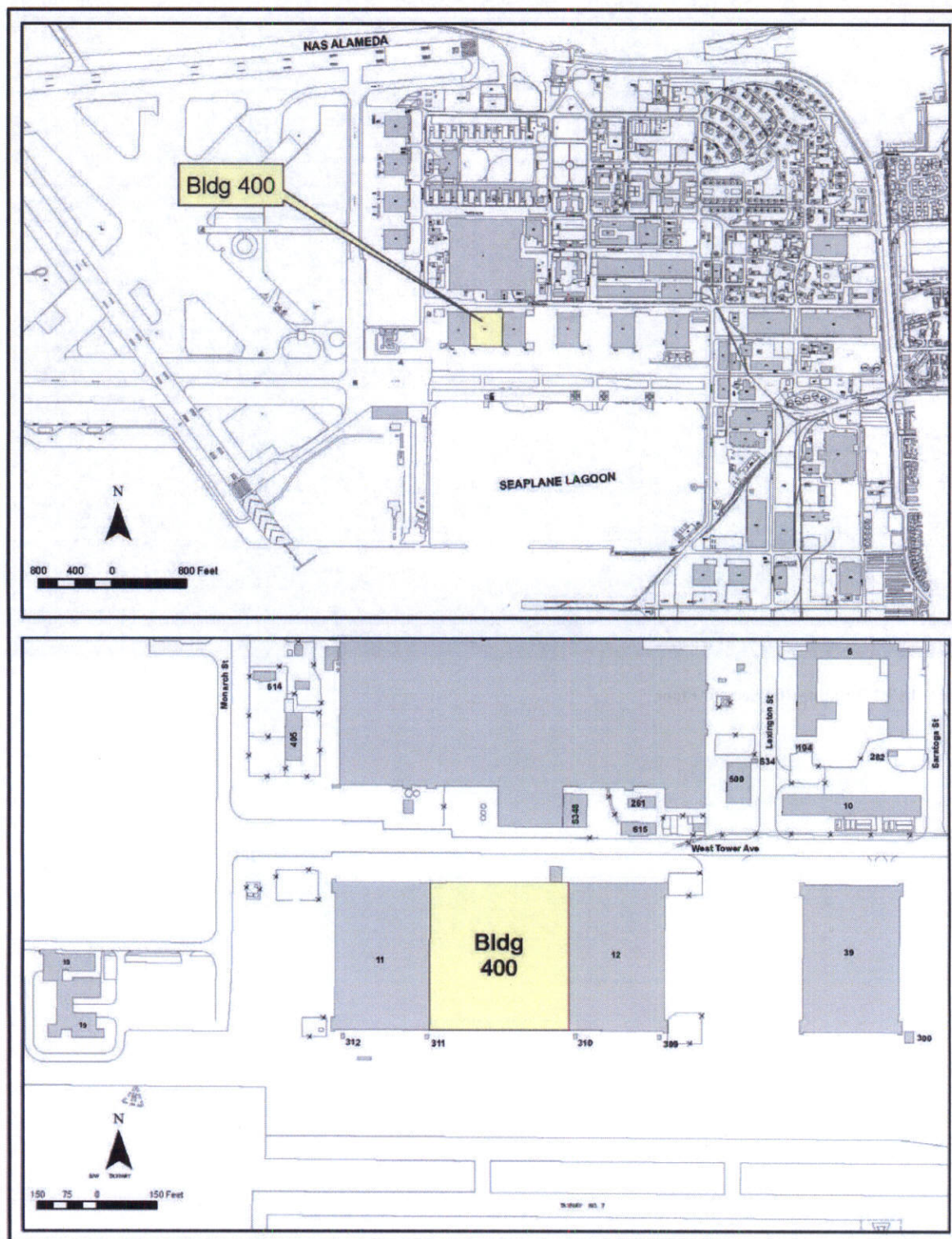


Figure 8-3.13.2 Building 400 Location

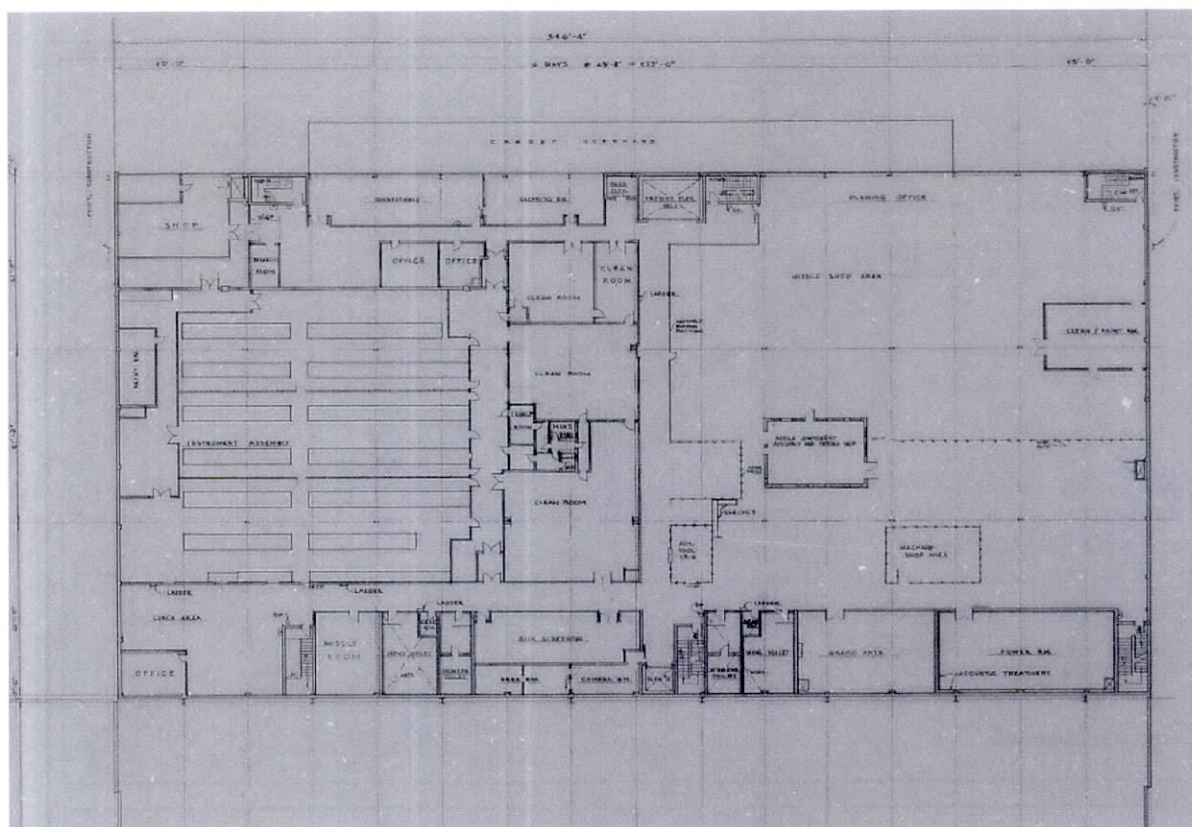


Figure 8-3.13.3 Building 400 Second Floor

8.3.14 Bunker 497



Figure 8-3.14.1 Bunker 497

Site Description: A large 7-cell special weapons magazine built in 1964. Each cell of the bunker had its own entrance and each cell provides floor space of approximately 750 ft². Figure 8-3.14.2 provides a site plan.

Former Uses: Possible use as a special weapons magazine.

Current Uses: Vacant

Potential Radionuclides of Concern: U-235, H-3.

Previous Radiological Investigations: In 1998, each cell of the bunker was surveyed for alpha, gamma, beta-gamma, and H-3. No contamination was detected (ALA-HRA-118). In 2000 RASO performed a confirmation survey and also detected no contamination (ALA-HRA-119).

Contamination Potential: Unlikely.

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None

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Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: Free Release is pending final Navy and regulatory agency review and concurrence.

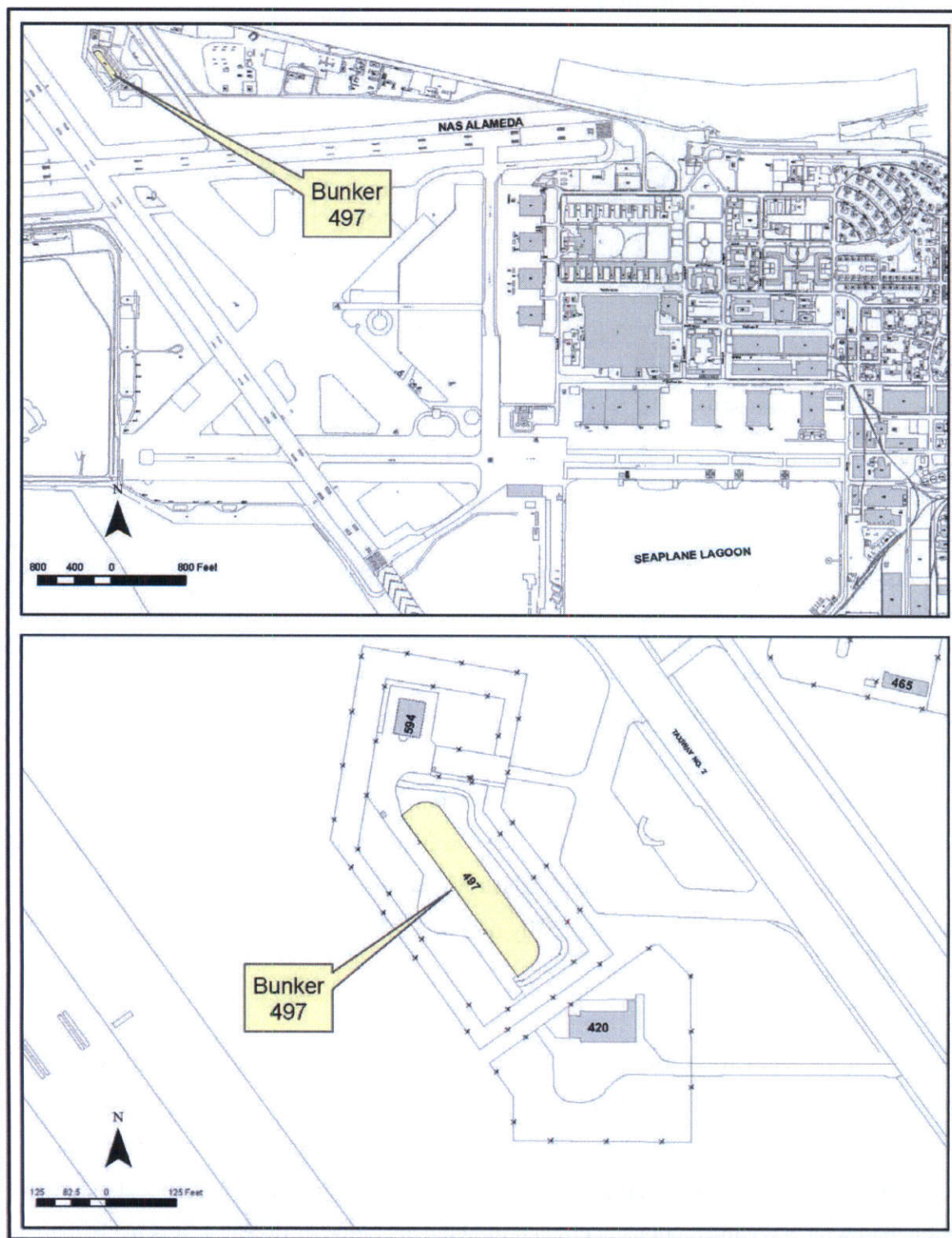


Figure 8-3.14.2 Bunker 497 Location

8.3.15 Installation Restoration Site 1

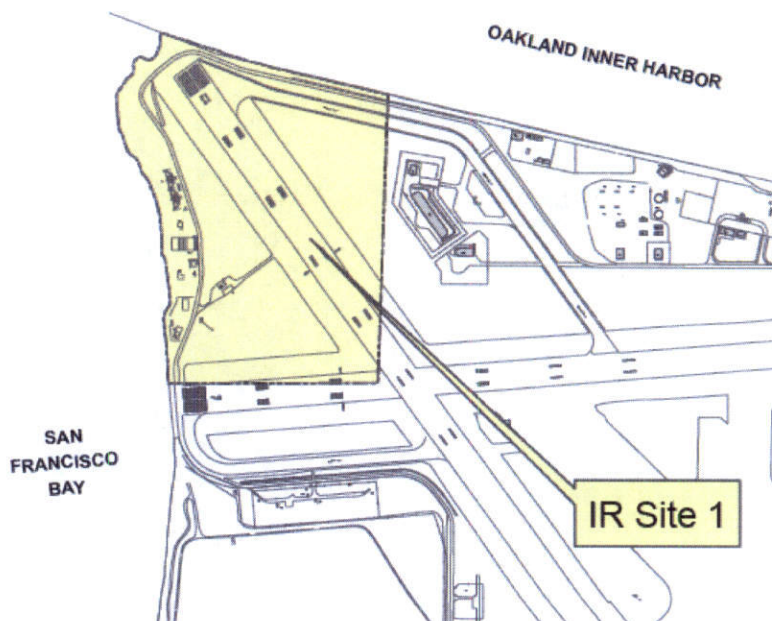


Figure 8-3.15.1 Installation Restoration Site 1

Site Description: IR Site 1 was the disposal area from 1943 until 1956. This area of approximately 78 acres was used for disposal of industrial and municipal waste from former NAS (ALA-HRA-5). IR Site 1 includes a former rifle range, several buildings, a jogging trail, and portions of two runways. The main north-south runway was built over the center of the disposal areas. During the time the disposal area was in use, it is likely that all waste generated on the naval air station, both household and industrial, was disposed of there. Radioactive wastes, the focus of this document, were clearly disposed of in this disposal area. Figure 8-3.15.2 provides a site plan.

Former Uses: IR Site 1 was the disposal site for all industrial and municipal waste generated on former NAS and many waste streams from other Navy bases in the general bay area. Known radioactive items disposed of (based on items recovered) include radium painted components, such as dials, switches, warning signs, radium and strontium deck markers, and optical glass. In addition, based on Navy instructions in effect during the operation of IR Site 1, it is likely that both liquid and solid waste generated by disassembly, cleaning, repair, and disposal of defective

components were also disposed of there. A smelter in operation until 1946 may have contributed metal slag contaminated with radium. A burn pit on the north end of IR Site 1 may have been used for incineration of paper wastes containing radium. Other radioactive components, which were overhauled and inspected by NAS, include DU counterweights and spark gap irradiators using Cs-137, Kr-85, Co-60, and UO₂.

Current Uses: Closed restricted access area. Restricted access is due to the presence of contamination that resulted from former disposal activities.

Potential Radionuclides of Concern: Ra-226, Cs-137, Sr-90, DU, UO₂, Th-232, Kr-85, Co-60

Previous Radiological Investigations: Four specific surveys have been performed. The first two surveys were manual surveys both of which identified some radioactive items that had been disposed of at various locations in the disposal area. The third and fourth surveys (in 1998/1999 [ALA-HRA-120] and in 2004 [ALA-HRA-74]) were comprehensive high-density surveys. Each survey made use of multiple detectors on a trailer pulled by a tractor or other vehicle. The detector output was coupled to a global positioning system and a computer such that precise coordinates were recorded for each set of detector data. The detectors were at a fixed height above the ground surface and were capable of detecting radium painted components buried up to 18 inches below the surface. At least one radiation reading was taken for each square foot of land surveyed. The survey maps produced by both of the high-density surveys are in close agreement in locating the radioactive material on and near the surface of the disposal area. The 2004 survey also collected 25 soil samples that were analyzed for Ra-226 and Sr-90. The samples were collected at locations indicated by elevated radiation levels. All of the samples had Ra-226 concentrations above the reference background levels and nine of the samples had Sr-90 levels above background levels. In situ gamma spectroscopy was used to analyze the soil at 13 of the highest survey locations. All of the in-situ analyses indicated the presence of Ra-226. No detailed remediation was performed based on the surveys of IR Site 1 but several anomalies noted during the survey were recovered and temporarily stored in Bunker 353. Some areas immediately adjacent to the shoreline and in rip-rap concentrations were not accessible even for an individual carrying a single hand-held detector and therefore were not surveyed.

Preliminary analysis of groundwater monitoring over the period 2002 to 2004 shows one monitoring location with elevated levels of both Ra-226 and Ra-228 and one monitoring location with elevated but below MCL levels of Sr-90 (ALA-HRA-77).

Contamination Potential: Known-Restricted Access.

Contaminated Media:

Surface Soil: High
Subsurface Soil: High
Sediment: High
Surface Water: Low
Groundwater: Low
Air: None
Structures: None
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: Low
Subsurface Soil: Low
Sediment: Low
Surface Water: Low
Groundwater: Low
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: Remediation. Develop a remediation plan based on the 2004 and 1998/1999 high-density surveys.

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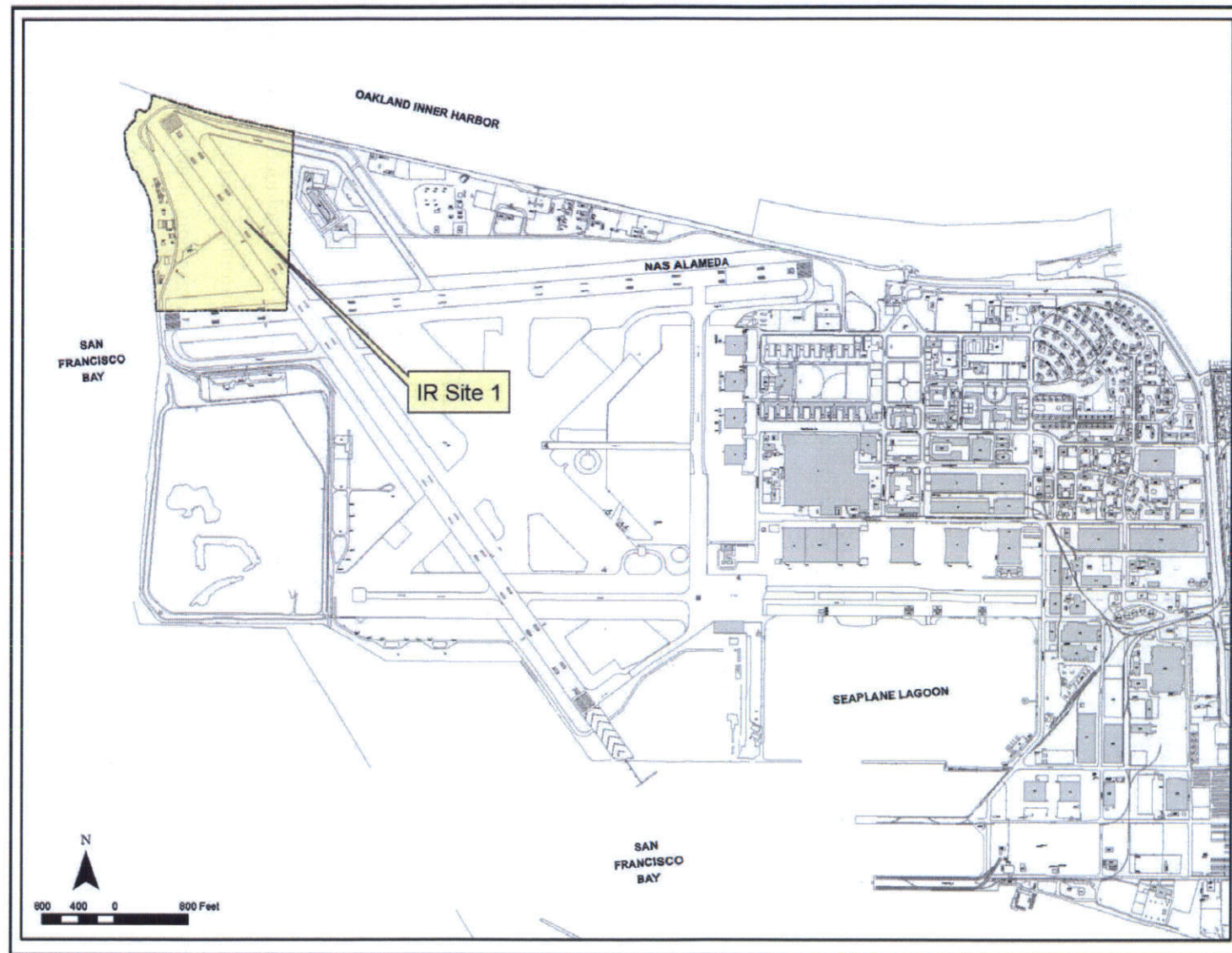


Figure 8-3.15.2 Installation Restoration Site 1 Location

8.3.16 Installation Restoration Site 2

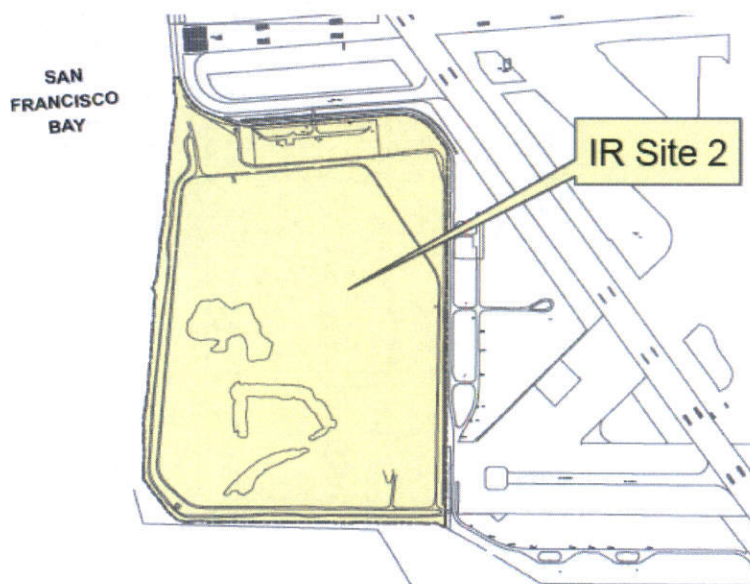


Figure 8-3.16.1 Installation Restoration Site 2

Site Description: Installation Restoration Site 2 is also called the West Beach Landfill. This landfill received essentially all wastes generated by former NAS from 1956 to 1978. As early as 1973, the radioactive wastes generated by NAS, NARF, and NADEP were being disposed of by licensed radioactive waste disposal firms at approved disposal facilities (**ALA-HRA-29, 30**). The landfill area is approximately 110 acres. A large area of this landfill is a wetland for the majority of the year (**ALA-HRA-75**). IR Site 2 was used for general disposal purposes. Wastes known to have been disposed of include solvents, metal cleaning compounds, electroplating solutions, paint, paint removers and thinners, sludges, oil, sand blast grit, PCB-contaminated oils, TAC rags, infectious wastes, laboratory wastes, asbestos, tear gas, mercury wastes, inert ordnance and pesticides (**ALA-HRA-5**). Radioactive items would have included wastes from radium painting operations, damaged instruments, and other radioluminescent devices including both radium and strontium deck or bridge markers, and thoriated glass optical devices. An earthen berm surrounds most of the IR Site 2 site. Figure 8-3.16.2 provides a site plan.

Former Uses: Disposal of NAS industrial and municipal wastes. In addition, the south end of Site 2 was used for the spoils from dredging activities.

Current Uses: None. Closed, Restricted Access Area.

Potential Radionuclides of Concern: Ra-226, Cs-137, Sr-90, DU, UO₂, Th-232, Kr-85, Co-60.

Previous Radiological Investigations: Three specific surveys have been performed. The first survey was a manual survey, which identified some radioactive items that had been disposed of at various locations in the landfill. The next two surveys (in 1998/1999 [ALA-HRA-120] and in 2004 [ALA-HRA-75]) were comprehensive high-density surveys. Each survey made use of multiple detectors on a trailer pulled by a tractor or other vehicle. The detector output was coupled to a global positioning system and a computer such that precise coordinates were recorded for each set of detector data. The detectors were at a fixed height above the ground surface and were capable of detecting radium painted components buried up to 18 inches below the surface. At least one radiation reading was taken for each square foot of land surveyed. The survey maps produced by both of the high-density surveys are in close agreement in locating the radioactive material on and near the surface of the landfill. Approximately 50 of the highest reading locations in IR Site 2 were excavated and partially remediated in 1999 (ALA-HRA-107). A complete remediation has not been conducted. Some areas immediately adjacent to the shoreline and in rip-rap concentrations were not accessible even for an individual carrying a single hand-held detector and therefore were not surveyed.

Preliminary analysis of groundwater monitoring from 2002 to 2004 shows one monitoring location with elevated but below MCL levels of tritium, and six monitoring locations with elevated levels of Ra-226 and Ra-228 (ALA-HRA-77).

Contamination Potential: Known-Restricted Access.

Contaminated Media:

Surface Soil: High
Subsurface Soil: High
Sediment: High

Surface Water: Low
Groundwater: Low
Air: None
Structures: None
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: Low
Subsurface Soil: Low
Sediment: Low
Surface Water: Low
Groundwater: Low
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: Remediation. Develop a remediation plan based on the 2004 and 1998/1999 high-density surveys.

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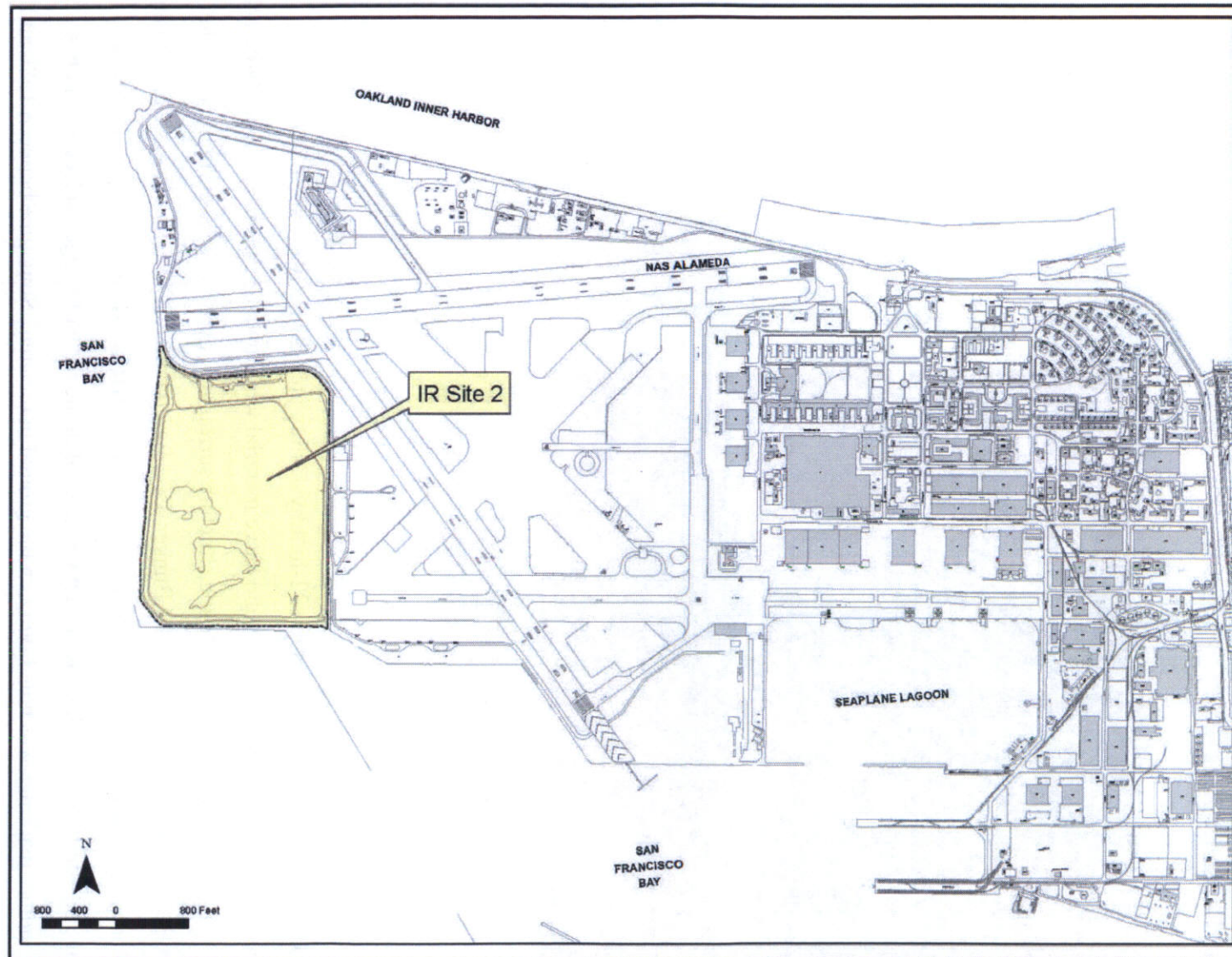


Figure 8-3.16.2 Installation Restoration Site 2 Location

8.3.17 RadShack Area



Figure 8-3.17.1 RadShack Area (1999 photo)

Site Description: An approximately 32-foot by 42-foot area formerly the site of a small structure (RadShack) used to store radioactive material while awaiting disposal. The RadShack Area was originally a small wood frame structure surrounded by a locked security fence in the West Beach Landfill area just west of Bunker 353. Based on RASO Technical Assistance visits, the RadShack was in use at least as early as 1973 (**ALA-HRA-29**) and remained in use as a storage site until at least 1980. Radioactive material in the form of oxygen selector switches with radium markings was noted lying on the ground in the area. Sometime between 1980 and 1983, the RadShack was emptied. One of the RASO representatives present during the 1983

Technical Assistance visit reported seeing some radioactive oxygen selector switches on the ground in the fenced in area. The soil exhibited direct readings well above background and a soil sample analyzed for Ra-226 contained 1.42 pCi/g above background (**ALA-HRA-45**). Figure 8-3.17.2 provides a site plan.

Former Uses: Storage of radioactive waste awaiting disposal.

Current Uses: None. The RadShack was emptied between 1980 and 1983. It was demolished except for the support posts before 1998.

Potential Radionuclides of Concern: Ra-226, Cs-137, Sr-90, and Th-232.

Previous Radiological Investigations: The RadShack Area was surveyed as part of the manual survey of IR Site 2, and as part of the 1998/1999 high-density survey of IR Site 2. A specific remediation was accomplished as part of the 1998/1999 high-density survey when the 50 highest reading locations in IR Site 2 were excavated and all identified discrete sources removed (**ALA-HRA-107**). The excavations were sampled and any soil with radium concentration greater than 5.0 pCi/g was removed. Radium components, radium and strontium deck markers and some optical glass were recovered from the area.

Contamination Potential: Known-Restricted Access.

Contaminated Media:

Surface Soil: High
Subsurface Soil: High
Sediment: High
Surface Water: Low
Groundwater: Low
Air: None
Structures: None
Drainage Systems: None

Potential Migration Pathways:

Surface Soil: Low
Subsurface Soil: Low
Sediment: Low

Surface Water: Low
Groundwater: Low
Air: None
Structures: None
Drainage Systems: None

Recommended Actions: Remediation. Develop a remediation plan based on the 1998/1999 and 2004 high-density surveys.

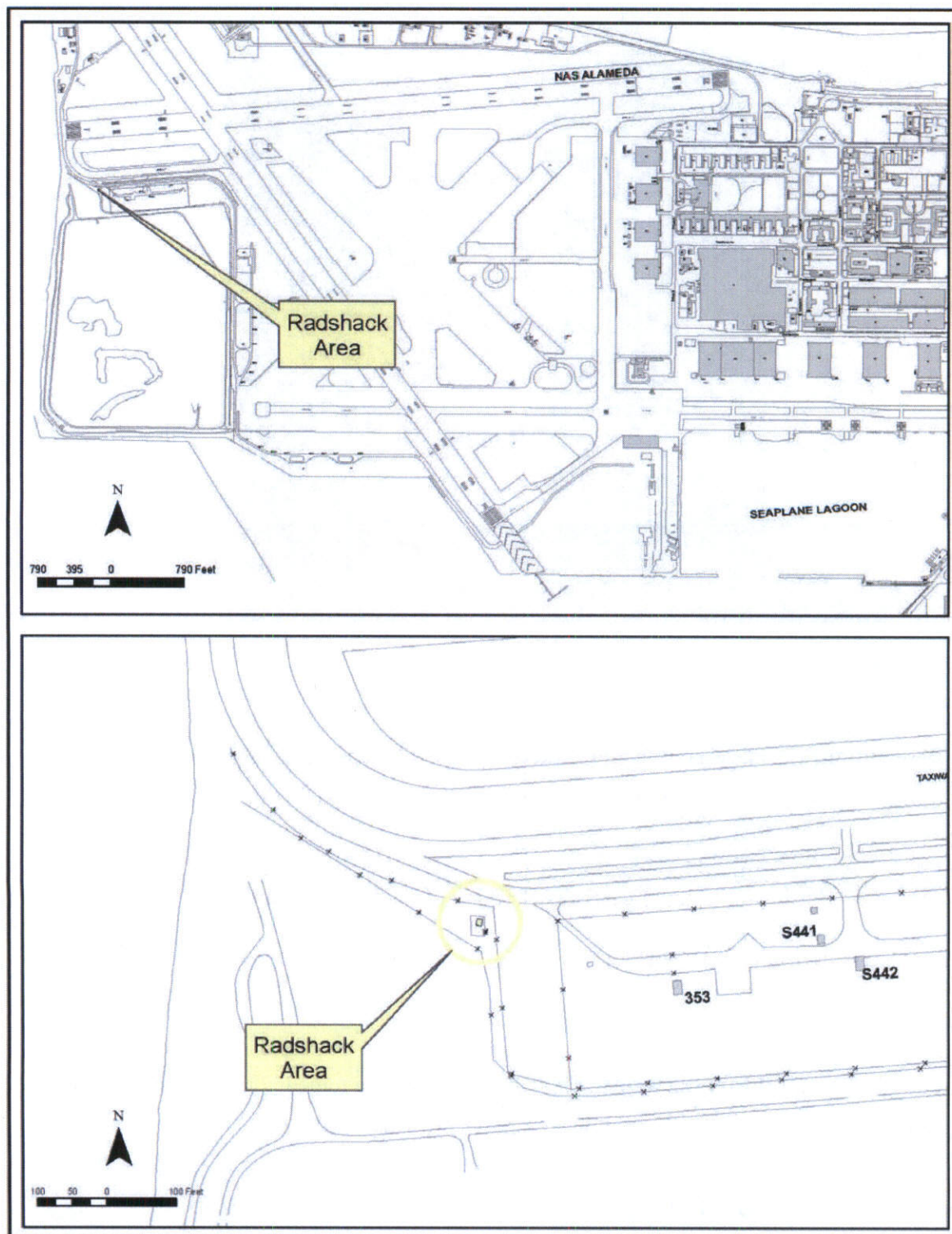


Figure 8-3.17.2 RadShack Area Location

8.3.18 Pier 3



Figure 8-3.18.1 Pier 3

Site Description: The largest of the three piers. Pier 3 was capable of supporting berthing of two aircraft carriers at the same time. Figure 8-3.18.2 provides a site plan.

Former Uses: Berthing of aircraft carriers. Berthing of nuclear aircraft carriers.

Current Uses: Berthing of USS Hornet. Berthing of MARAD ships.

Potential Radionuclide of Concern: Sr-90

Previous Radiological Investigations: 1996 survey following remediation of a crushed Sr-90 source in the crane track. All traces of Sr-90 removed (ALA-HRA-121).

Contamination Potential: Unlikely.

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Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Storm Water Drainage Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Storm Water Drainage Systems: None

Recommended Actions: Free Release pending final Navy and regulatory agency review.

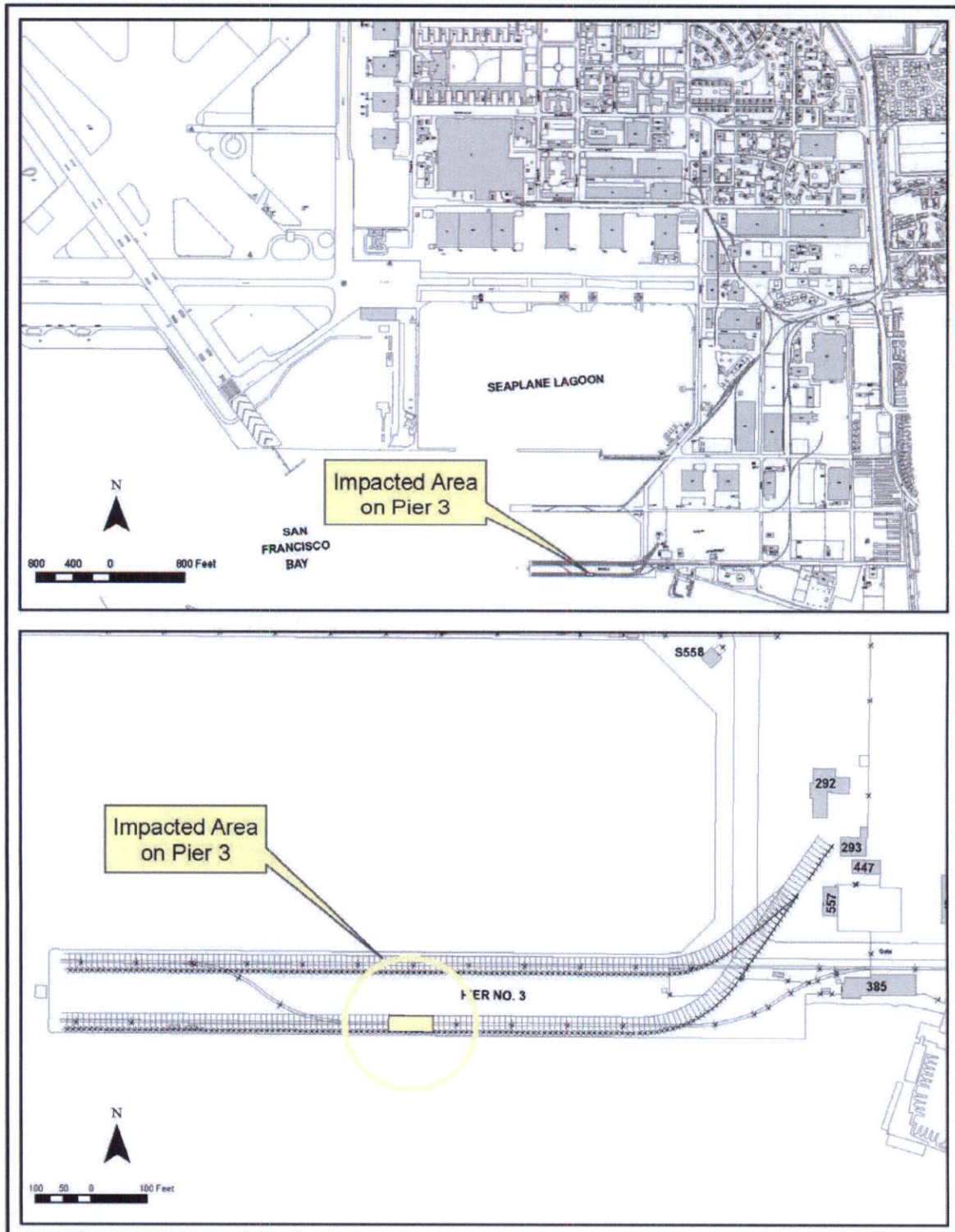


Figure 8-3.18.2 Pier 3 Location

8.3.19 Seaplane Lagoon

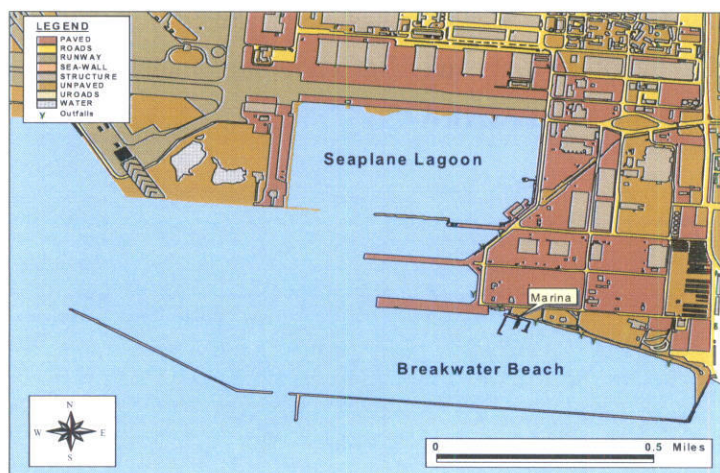


Figure 8-3.19.1 Seaplane Lagoon

Site Description: The Seaplane Lagoon is a man-made lagoon approximately 3,000 feet long by 1,600 feet wide (ALA-HRA-127). The storm drains from several nearby facilities discharge into one of several outfalls in the lagoon. Figure 8-3.19.2 provides a site plan.

Former Uses: Seaplane dock for Navy seaplanes.

Current Uses: None

Potential Radionuclides of Concern: Ra-226.

Previous Radiological Investigations: A detailed sampling of the lagoon was performed in 1996. Sediment samples were collected at 45 locations throughout the Seaplane Lagoon. The samples were split into sections by depth. Radium-226 was detected in more than 30 of the individual samples. The highest concentration of 3.92 pCi/g (approximately four times background levels) was detected at a depth of about 2.5 feet at a sample location adjacent to storm drain outfall F in the northwest corner of the lagoon (ALA-HRA-78). In November 2002, a joint sampling program between the University of California at Berkeley and Battelle Institute collected sediment samples at 20 locations inside and near the mouth of the seaplane lagoon.

This sampling was to study the depositional history of the lagoon. Analysis methods include chemical and radiochemical means. Radiochemistry data from one sample (BERC 13) which was in close proximity to the highest sample from the 1996 sampling, and also adjacent to outfall F indicated a maximum concentration of Ra-226 of approximately 7 pCi/g (approximately seven times background levels) at a depth of about 3.5 feet (ALA-HRA-79).

Contamination Potential: Likely

Contaminated Media:

Surface Soil: Moderate
Subsurface Soil: Moderate
Sediment: Moderate
Surface Water: None
Groundwater: None
Air: None
Structures: None
Sanitary Sewer Systems: None

Potential Migration Pathways:

Surface Soil: Moderate
Subsurface Soil: Moderate
Sediment: Moderate
Surface Water: None
Groundwater: None
Air: None
Structures: None
Sanitary Sewer Systems: None

Recommended Actions: Implement the CERCLA remedial action specified in the Final Record of Decision for Seaplane Lagoon (IR Site 17), which includes radium sampling and waste characterization within the defined remediation areas.

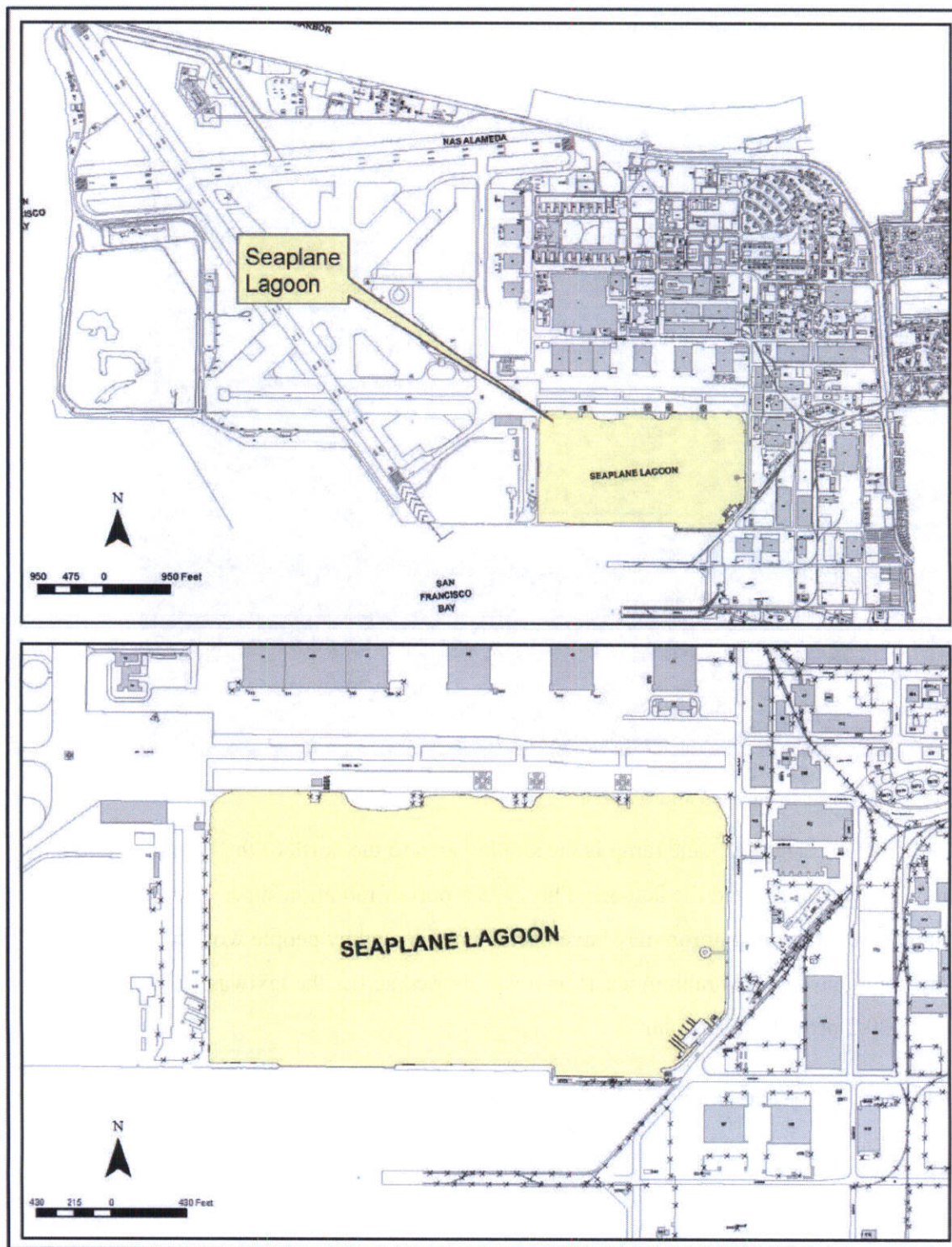


Figure 8-3.19.2 Seaplane Lagoon Location

8.3.20 Seaplane Ramp and Parking Apron



Figure 8-3.20.1 Seaplane Ramp and Parking Apron

Site Description: The Seaplane ramp is the sloping area to the north of the lagoon where the seaplanes entered and exited the lagoon. The 1998 report of radiation surveys indicates that the ramp and adjacent parking apron may have been contaminated by people working in Building 400 who could have spilled radium waste as it was carried across the taxiway to the lagoon. Figure 8-3.20.2 provides a site plan.

Former Uses: Entry and exit point for seaplanes.

Current Uses: None

Potential Radionuclide of Concern: Ra-226.

Previous Radiological Investigations: A 100% survey of the suspect surfaces with a gamma scintillation detector revealed no anomalies (ALA-HRA-125).

Contamination Potential: Unlikely

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Sanitary Sewer Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Sanitary Sewer Systems: None

Recommended Actions: Free Release pending final Navy and regulatory agency review and concurrence.

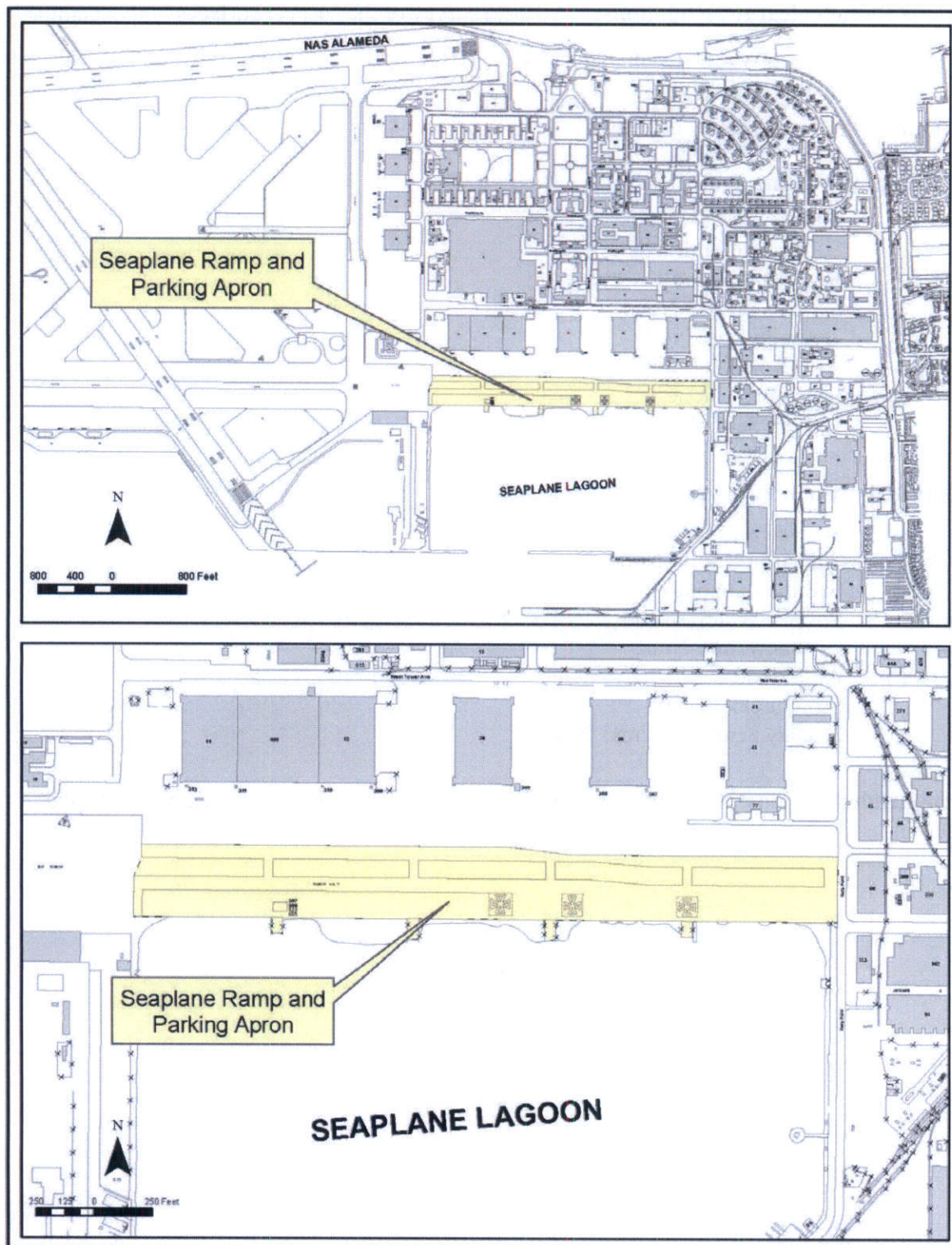


Figure 8-3.20.2 Seaplane Ramp and Parking Apron Location

8.3.21 Smelter

Site Description: The smelter was located just east of Building 66 in 1949 (ALA-HRA-103). By 1954, the smelter and the scrap bins were gone. Buildings 398 and 399 now stand in this location.

Former Uses: No history of smelter use has been found. Melting of scrap metals is typical activity for a smelter. It is likely that slag and other waste from the smelter operation were disposed of in the 1943-1956 disposal area.

Current Uses: None, smelter has been demolished.

Potential Radionuclide of Concern: Ra-226, Co-60, Cs-137, Pu-239, Sr-90, and UO₂.

Previous Radiological Investigations: None identified.

Contamination Potential: Unlikely

Contaminated Media:

Surface Soil: None
Subsurface Soil: Low
Sediment: None
Surface Water: None
Groundwater: None
Air: None: None
Structures: None
Sanitary Sewer Systems: Low

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: Low
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Sanitary Sewer Systems: Low

Recommended Actions: Perform a Scoping Survey in the vicinity of the former smelter including the storm drains and sanitary drains in the immediate area. Further action to be determined based on the results of the Scoping Survey.

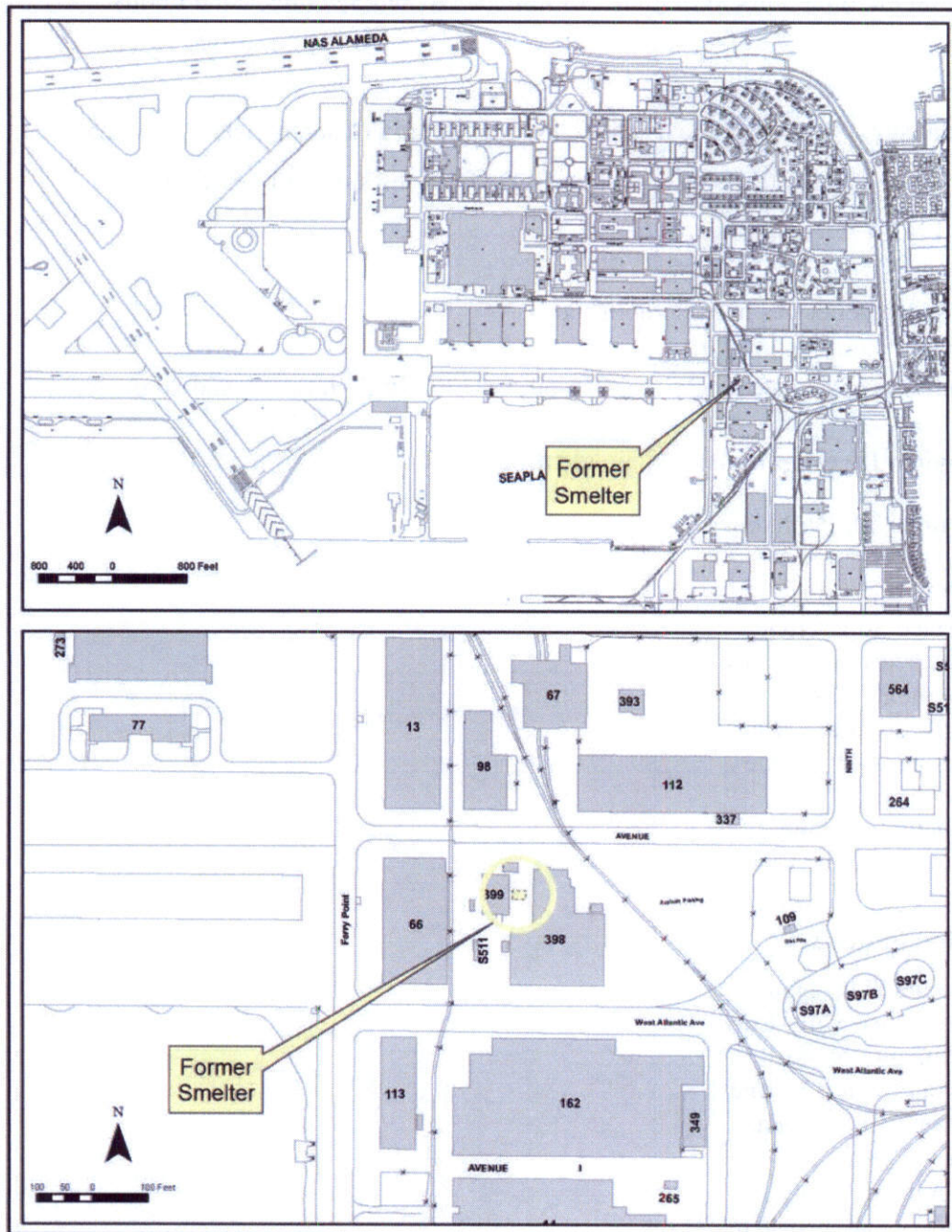


Figure 8-3.21.1 Former Smelter (1949)

8.3.22 Storm Drain System and Sanitary Drain System

Site Description: Sink drains in the radium paint facility in Building 5 were connected directly to the storm drain system. The liquid radium waste from the paint facility on the mezzanine floor of Building 5 was apparently put down the drain. Similarly, the drain piping from the radium paint rooms and radium storage rooms on the second floor of Building 400 connected to both the storm drain piping and the sanitary drain piping exiting the building on the north side. The storm drain piping from both buildings joins before discharging at outfall F on the northwest corner of the Seaplane Lagoon.

Former Uses: Storm water drains and sanitary drains.

Current Uses: Storm water drains and sanitary drains.

Potential Radionuclide of Concern: Ra-226.

Previous Radiological Investigations: A detailed investigation of the storm drains associated with buildings 5 and 400 was conducted in December 1997 (**ALA-HRA-123**). Almost 6,000 feet of storm drain and sanitary sewer drain were surveyed. In addition, several solid samples were collected for gamma spectroscopy analyses, the samples were taken at the storm drain outfalls and from some of the system manholes in the system. All or portions of approximately 4,000 feet of storm and sanitary drain piping contained radium above the detection limits. Removal and replacement or in-place decontamination of storm drain piping and manholes was performed during the period of November 1998 through October 1999. More than 700 feet of contaminated piping outside of Building 5 was removed. Approximately 700 feet of contaminated piping was decontaminated by hydro-blasting. This included piping from both Building 5 and Building 400. Three contaminated manholes near Building 5 were removed and replaced. Concrete, asphalt, and overburden soil removed to gain access to the storm drain and sanitary drain piping were surveyed and sampled (**ALA-HRA-124**). Removal actions did not include the known contaminated piping under the floor in Building 5, the abandoned drain line

from outside Building 5 leading back under the floor of the building, or the potentially contaminated sanitary drain piping from Building 400.

Contamination Potential: Likely

Contaminated Media:

Surface Soil: None
Subsurface Soil: Low
Sediment: Low
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: Low

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: Low
Sediment: Low
Surface Water: None
Groundwater: None
Air: None
Structures: None
Drainage Systems: Low

Recommended Actions: Complete the Remediation.

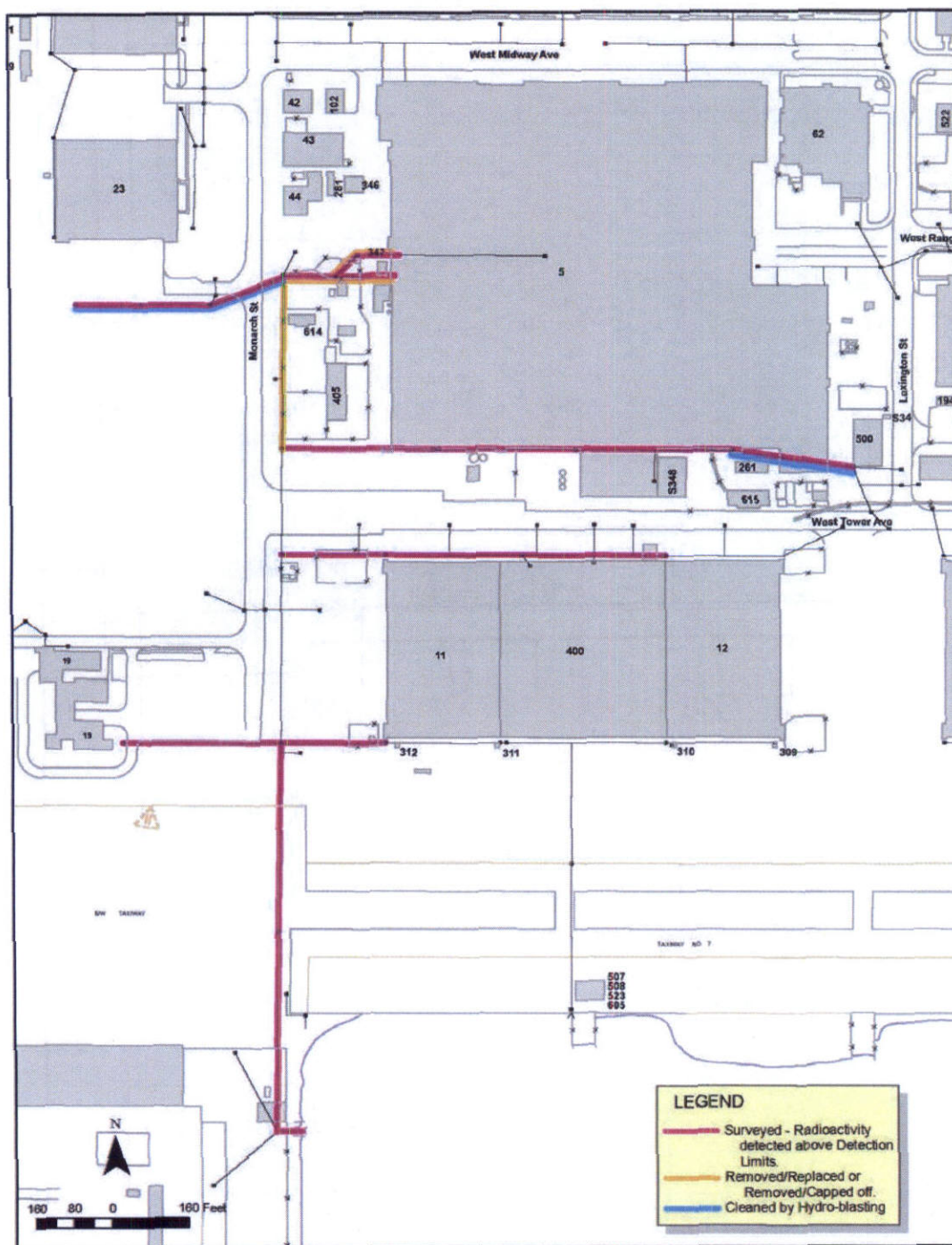


Figure 8-3.22.1 Storm Drain System associated with Buildings 5 and 400

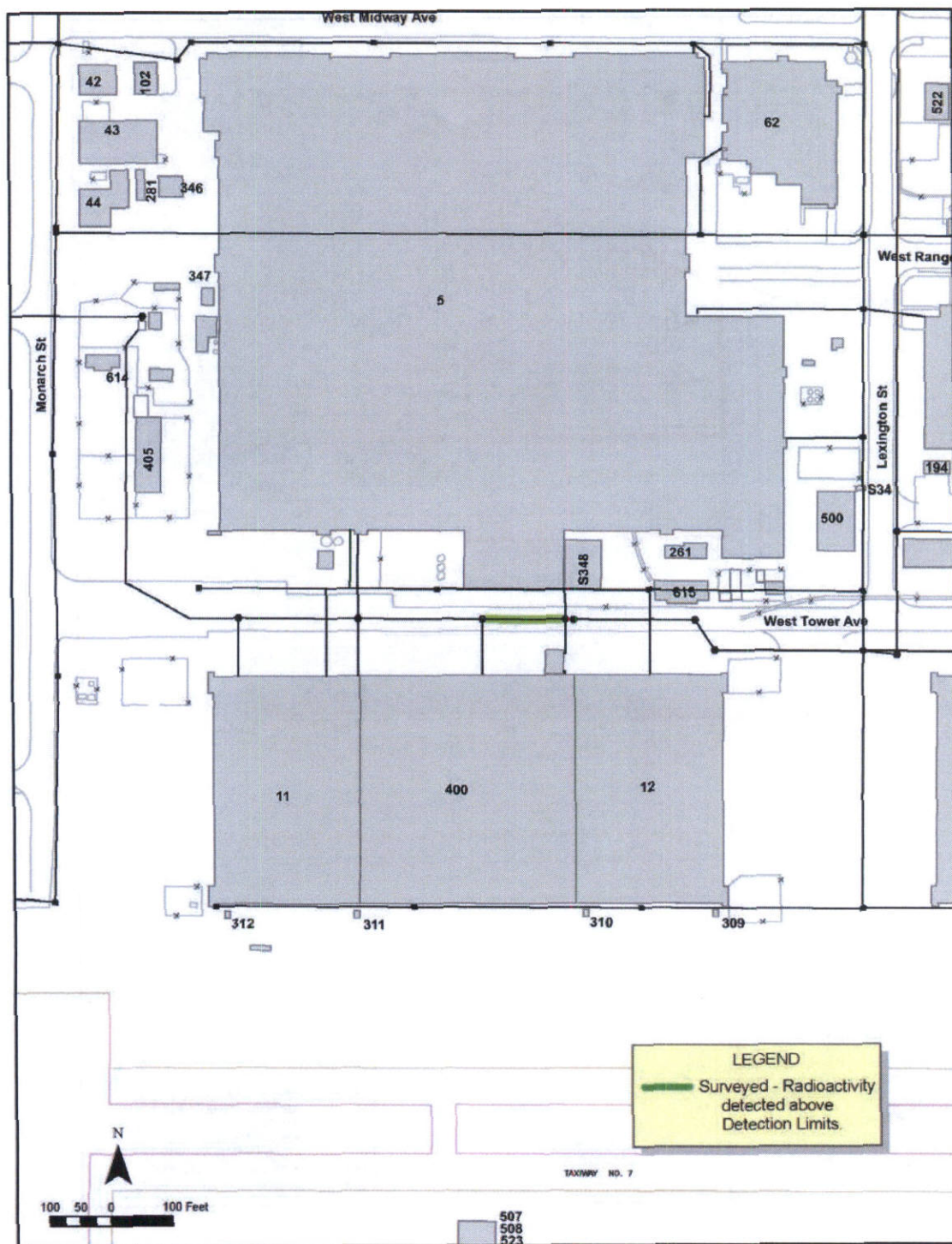


Figure 8-3.22.2 Sanitary Drain System associated with Building 400

8.3.23 Alameda Annex

Site Description: The Alameda Annex is an approximately 81-acre site to the east of former NAS (ALA-HRA-128). Approximately a 9-acre portion of the Alameda Annex served as the DRMO screening lot and scrap yard. The DRMO scrap yard is also identified as Installation Restoration Site 02 of the FISCA. In this location material was screened for resale or designated for disposal as scrap. Radioactive materials were not supposed to be disposed of via the DRMO operation. However, some DRMO scrap yards received equipment and components for disposal that contain radioactive materials (principally radium). Figure 8-3.23.1 provides a site plan.

Former Uses: Supply system warehouses and storage, screening and disposal operations.

Current Uses: None

Potential Radionuclides of Concern: Ra-226, DU

Previous Radiological Investigations: A detailed survey was performed in 1994 at ground level and at 3 feet above ground level. This survey identified the presence of three small drums containing DU. One of the drums was open and the contents were covered with rainwater. The survey also identified the presence of some pallets of firebrick, which is sometimes high in naturally occurring radioactive material such as uranium and thorium. Ten locations were identified that exhibited gamma readings appearing to be above the expected distribution of readings about the average. The survey covered all of the outside areas of the scrap yard except the scrap piles. The survey did not cover the inside of the hangar building (Building 365) (ALA-HRA-108). In 2002, a resurvey of the DRMO scrap yard concentrated on the locations identified during the earlier survey. During this survey, three rectangular areas (approximately 10,000 ft², 15,000 ft² and 22,500 ft²) were surveyed with multiple gamma scintillation detectors mounted on a trailer. Soil samples were collected in each of the three areas. All samples were analyzed for radium. The radium concentration was significantly below 1.0 pCi/g in each of the three areas. The soil samples in the area where the DU was found in the 1996 survey were also

analyzed for uranium isotopes. The U-238, U-235 and U-234 concentrations in all samples were less than 1.0 pCi/g. No samples exceeded the DCGL's for radium or uranium. The 2002 survey did not cover the entire approximately 9 acres of the scrap yard, but did completely cover the locations where the firebrick and the DU were found during the 1994 survey (ALA-HRA-109). The CDHS has concurred to the release of the former Screening lot/scrap yard (ALA-HRA-110).

Contamination Potential: Unlikely

Contaminated Media:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Sanitary Sewer Systems: None

Potential Migration Pathways:

Surface Soil: None
Subsurface Soil: None
Sediment: None
Surface Water: None
Groundwater: None
Air: None
Structures: None
Sanitary Sewer Systems: None

Recommended Actions: No Further Action. Free released by CDHS in 2003.

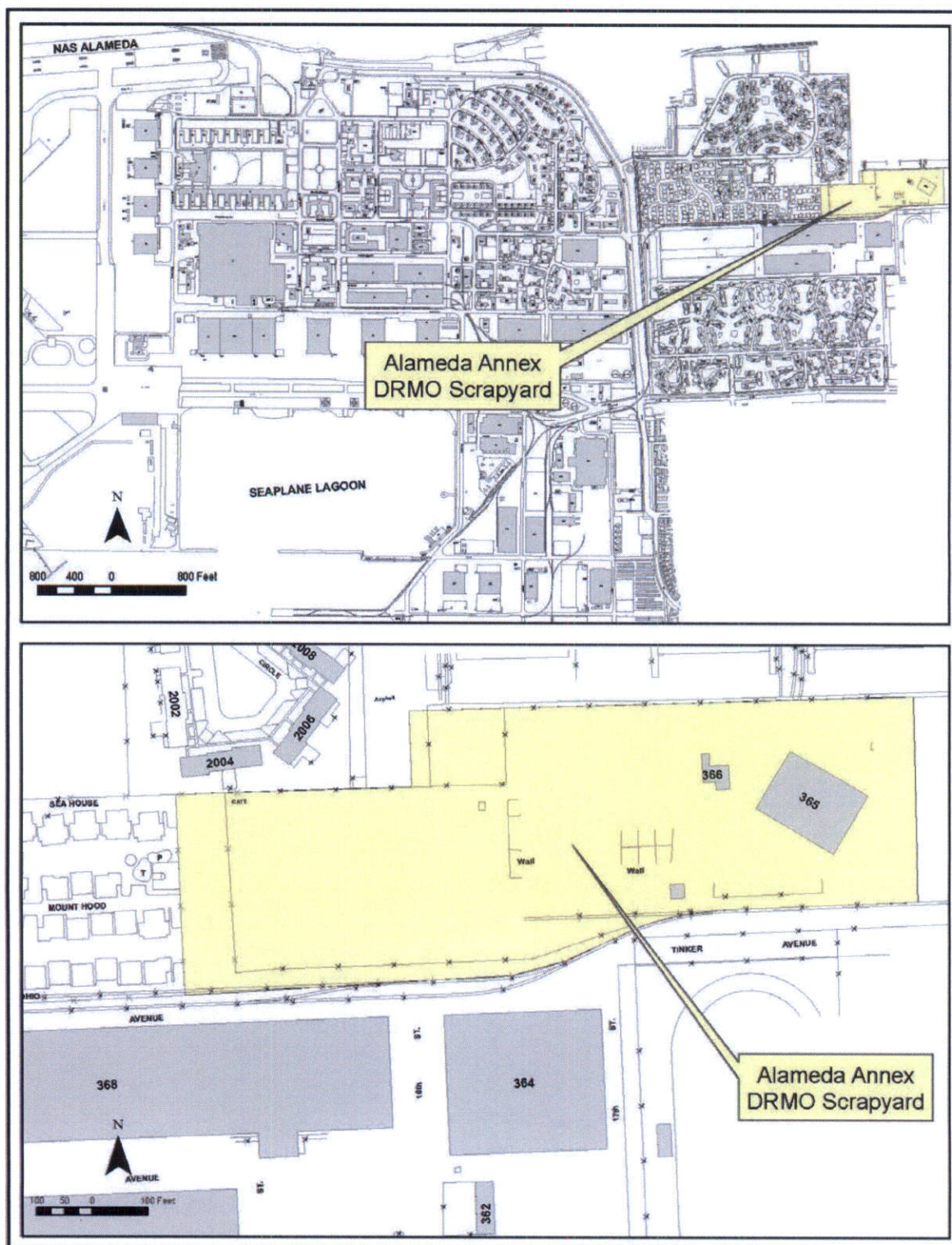


Figure 8-3.23.1 Alameda Annex DRMO Scrapyard Location

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SECTION 8

TABLES

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**TABLE 8-1
IMPACTED SITES AT FORMER NAS
FORMER AND CURRENT USES**

Building/Site No.	Former Use	Current Use
Building 5	Assembly and Repair Shop. Radium paint rooms, storage of radioactive waste, storage of DU, and storage of H-3 exit signs. Possible use for decontamination of radioactive (Sr-90, Cs-137 and Pu-239) aircraft engines.	Vacant
Building 7	Materials Engineering Laboratory. Former location of gas chromatograph equipment with Ni-63 source.	Occupied
Hangar 12	Seaplane hangar. Inspection of DU counterweights.	Industrial facility
Building 42	Engineering laboratory. Original location of gas chromatograph with Ni-63 sources.	Commercial caterer
Building 44	Aeronautical materials laboratory. Interim storage for DU counterweights. Southeast corner of building used to test radium dials and gauges.	Occupied
Building 66	Jet engines overhaul facility. Work on ignition equipment containing Cs-137, Co-60, Kr-85 and/or UO ₂ . Possible use for decontamination of radioactive aircraft engines.	Light industrial – rigging shop
Building 113	Jet engines overhaul facility. Possible use for decontamination of radioactive (Sr-90, Cs-137 and Pu-239) aircraft engines.	Occupied
Building 114	Public Works offices and maintenance shops. Temporary storage of radioactive (Ra-226) piping from Building 5.	Vacant
Building 309	Storage of DU counterweights.	Occupied

TABLE 8-1
IMPACTED SITES AT FORMER NAS
FORMER AND CURRENT USES

Building/Site No.	Former Use	Current Use
Building 310	Storage of new and corroded DU counterweights and radium waste.	Storage
Building 346	Drop tank cleaning shop. Materials laboratory. Temporary storage of radioactive waste (possibly Ra-226, DU and Cs-137) and instrument calibration sources (Ra-226).	Vacant
Bunker 353	High Explosives magazine. Temporary storage of radioactive anomalies (Ra-226, Sr-90 and Th-232) removed from IR Site 1 and IR Site 2.	Temporary storage of radioactive material
Building 400	Avionics building. Radium instrument paint facility. DU storage and spark gap irradiator (Cs-137, UO ₂ , Co-60 and Kr-85) work.	Industrial facility
Bunker 497	Special weapons (U-235 and H-3) bunker.	Vacant
IR Site 1	Disposal area from 1943 to 1956. Burial of various radium and other (Cs-137, Sr-90, DU, UO ₂ and Th-232) radioactive wastes.	Inactive, Restricted Access
IR Site 2	Landfill/disposal area from 1956 to 1978. Burial of various radium and other (Sr-90 and Th-232) radioactive wastes.	Inactive, Wetlands, Restricted Access
RadShack Area	Specific radioactive material (Ra-226, Cs-137, Sr-90 and Th-232) storage area located at the north end of IR Site 2.	Inactive, Restricted Access
Pier 3	Berthing for aircraft carriers and other Navy vessels.	Berthing for MARAD vessels and USS HORNET
Seaplane Lagoon	Location where seaplanes entered and exited the bay. Discharge location for the storm drains from Building 5 and 400 (Ra-226).	Miscellaneous marine use
Seaplane Ramp and parking apron.	Access to the seaplane lagoon from the hangars at Buildings 11, 400, and 12 (Ra-226).	Not in use

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TABLE 8-1 IMPACTED SITES AT FORMER NAS FORMER AND CURRENT USES		
Building/Site No.	Former Use	Current Use
Smelter	Melting of scrap metals (Ra-226).	Demolished
Storm Drain and Sanitary Drain Systems	Industrial drain for Buildings 5 and 400 and in particular the locations associated with radium paint facility work in both buildings (Ra-226).	Partially still in use. (Some remediation of storm and sanitary drain lines has occurred via removal/replacement)
Alameda Annex	Eleven-acre portion of the Annex served as the DRMO screening and disposal yard (Ra-226, DU).	Vacant.

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TABLE 8-2
BUILDING/AREA ASSESSMENT AND CLASSIFICATION

Building or Area	Contamination Potential					Contaminated Media							Potential Migration Pathways							Radionuclides of Concern; Recommended Actions		
	Known Restricted Access	Known Continued Access	Likely	Unlikely	Unknown	Surface Soil	Subsurface Soil	Sediment	Surface Water	Ground Water	Air	Structures	Drainage System	Surface Soil	Subsurface Soil	Sediment	Surface Water	Ground Water	Air		Structures	Drainage Systems
5			X			N	N	N	N	N	N	L	H	N	N	N	N	N	N	N	M	Ra-226, Cs-137, DU, H-3, Pu-239; Final status surveys, remediation of drain piping, and scoping survey of ventilation.
7				X		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ni-63; Free release
12				X		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	DU; No further action
42				X		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ni-63; No further action
44				X		N	N	N	N	N	N	L	N	N	N	N	N	N	N	N	N	Ra-226 and DU; Characterization survey
66				X		N	N	N	N	N	N	L	N	N	N	N	N	N	N	N	N	Cs-137, Kr-85, Co-60, UO ₂ ; Free release (partial); Characterization Survey (main

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TABLE 8-2
BUILDING/AREA ASSESSMENT AND CLASSIFICATION

Building or Area	Contamination Potential					Contaminated Media							Potential Migration Pathways							Radionuclides of Concern; Recommended Actions		
	Known Restricted Access	Known Continued Access	Likely	Unlikely	Unknown	Surface Soil	Subsurface Soil	Sediment	Surface Water	Ground Water	Air	Structures	Drainage System	Surface Soil	Subsurface Soil	Sediment	Surface Water	Ground Water	Air		Structures	Drainage Systems
																						floor)
113				X		N	N	N	N	N	N	L	N	N	N	N	N	N	N	N	N	Cs-137, Pu-239; Characterization Survey
114				X		N	N	N	N	N	N	L	N	N	N	N	N	N	N	N	N	Ra-226; Characterization Survey
309				X		N	N	N	N	N	N	L	N	N	N	N	N	N	N	N	N	DU; Characterization Survey
310				X		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ra-226, DU; Free release
346				X		N	N	N	N	N	N	L	N	N	N	N	N	N	N	N	N	Ra-226, DU and Cs-137; Final Status Survey
353				X		N	N	N	N	N	N	L	N	N	N	N	N	N	N	L	N	Ra-226, Sr-90 and Th-232; Remove radioactive material, perform Final Status

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TABLE 8-2
BUILDING/AREA ASSESSMENT AND CLASSIFICATION

Building or Area	Contamination Potential					Contaminated Media								Potential Migration Pathways								Radionuclides of Concern; Recommended Actions
	Known Restricted Access	Known Continued Access	Likely	Unlikely	Unknown	Surface Soil	Subsurface Soil	Sediment	Surface Water	Ground Water	Air	Structures	Drainage System	Surface Soil	Subsurface Soil	Sediment	Surface Water	Ground Water	Air	Structures	Drainage Systems	
																						Survey
400			X			N	N	N	N	N	N	L	L	N	N	N	N	N	N	N	L	Ra-226, Co-60, Cs-137, Kr-85, UO ₂ , DU; Final Status Survey Ra-226 & DU rooms, Remediate drain piping, Characterization Survey ventilation from Ra-226 room., Characterization Survey third floor
497				X		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	U-235, H-3; Free release
IR Site 1	X					H	H	H	L	L	N	N	N	L	L	L	L	L	N	N	N	Ra-226, Sr-90, DU, Cs-137, UO ₂ , Th-232; Remediation
IR Site 2	X					H	H	H	L	L	N	N	N	L	L	L	L	L	N	N	N	Ra-226, Sr-90, DU, Cs-137, UO ₂ ,

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TABLE 8-2
BUILDING/AREA ASSESSMENT AND CLASSIFICATION

Building or Area	Contamination Potential					Contaminated Media								Potential Migration Pathways								Radionuclides of Concern; Recommended Actions
	Known Restricted Access	Known Continued Access	Likely	Unlikely	Unknown	Surface Soil	Subsurface Soil	Sediment	Surface Water	Ground Water	Air	Structures	Drainage System	Surface Soil	Subsurface Soil	Sediment	Surface Water	Ground Water	Air	Structures	Drainage Systems	
																						Th-232; Remediation
RadShack Area	X					H	H	H	L	L	N	N	N	L	L	L	L	L	N	N	N	Ra-226, Sr-90, DU, Cs-137, UO ₂ , Th-232; Remediation
Pier 3				X		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Sr-90; Free release
Seaplane Lagoon			X			M	M	M	N	N	N	N	N	M	M	M	N	N	N	N	N	Ra-226; Remediation
Seaplane Ramp and Parking Apron				X		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ra-226; Free release.
Smelter				X		N	L	N	N	N	N	N	L	N	L	N	N	N	N	N	L	Ra-226; Scoping Survey in vicinity of smelter
Storm Drain System and Sanitary Drain System			X			N	L	L	N	N	N	N	L	N	L	L	N	N	N	N	L	Ra-226; Remediation
Alameda Annex				X		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ra-226, DU; No further action, released by CDHS

H - High
L - Low
M - Moderate
N - None

9.0 CONCLUSIONS

9.1 HISTORICAL RESEARCH

Former NAS is located at the western end of Alameda Island in San Francisco Bay. Former NAS was commissioned on November 1, 1940. Alameda Annex is located just to the east of former NAS and consists of approximately 81 acres. The Annex property became part of the Navy complex beginning in 1956 and the total area of the station grew to 2,686 acres. The original plan for former NAS was to construct a 1,000-man air station. The advent of World War II changed those plans drastically. By the end of World War II, the civilian employment had grown to over 9,000 persons. The first identified uses of radioactive materials on former NAS involved inspection, cleaning, repair and refurbishment of radium painted instruments used in Navy aircraft. This work was in progress as early as 1941.

9.2 POTENTIALLY IMPACTED SITE ASSESSMENTS

The preparation of the NAS Alameda HRA, Volume II was an extended process that involved review of hundreds of records from federal and private record repositories. Some electronic mail and telephonic contact with persons with knowledge of radiological operations at former NAS were also utilized. The information extracted from this process identified a total of 685 (plus 340 residential) historic and current sites, including buildings, structures, defined open areas, and ships' berths. Of these, 23 former NAS sites have been designated as "potentially impacted." This indicates the site is an area that has or historically had a potential for G-RAM contamination based on the site operating history or known contamination detected during previous radiation surveys. These potentially impacted sites include:

- Overhaul and repair of aircraft instruments containing Ra-226 painted components (Buildings 5 and 400).
- Inspection, handling, storage, repair, and disposal of aircraft counterweights containing DU (Buildings 5, 12, 44, 309, 310, 400, and Alameda Annex).

- Operation of gas chromatography analysis equipment utilizing radioactive Ni-63 (Buildings 7 and 42).
- Overhaul, and repair of electronic devices such as spark gap irradiators that utilize radioactive Cs-137, Co-60, Kr-85 or UO₂ (Building 66 and 400).
- Disassembly, inspection and decontamination of aircraft engines that had been exposed to airborne radioactivity (Sr-90, Cs-137 and Pu-239) from nuclear weapons testing (Potentially Buildings 5, 66, 113).
- Storage of various radioactive materials (Buildings 5, 114, 309, 310, 346, 353, RadShack Area).
- Storage and handling of H-3 exit signs (Buildings 5, 497).
- Possible storage of nuclear weapons (U-235, H-3) (Building 497).
- Broken radioactive (Sr-90) device (Pier 3).
- On-site disposal of various radioactive materials (IR Site 1, IR Site 2, RadShack Area).
- Disposal of Ra-226 contaminated liquids via the storm drain system and sanitary drain system (Seaplane Lagoon, Seaplane Ramp, Sanitary Sewer System, Storm Drain System).
- Recycling of Ra-226 aircraft components (Smelter). Recycling of DU and Ra-226 aircraft components (DRMO Scrapyard located in the Alameda Annex).

The potential for residual contamination at impacted sites was assessed using the following categories: Known-Restricted Access, Known-Continued Access, Likely, Unlikely, and Unknown. The assessment of potential contamination at the 23 impacted sites is summarized as follows:

- 3 – Known-Restricted Access (IR Site 1, IR Site 2, RadShack Area)
- 1 – Known Continued Access (Building 5)
- 3 – Likely (Building 400, Seaplane Lagoon, Storm and Sanitary Drains)
- 16 – Unlikely (Buildings 7, 12, 42, 44, 66, 113, 114, 309, 310, 346, 353, 497, Pier 3, Seaplane Ramp and Parking Apron, Smelter, Alameda Annex)
- 0 – Unknown

The categories high, moderate, low, and none were used to assess potentially contaminated media for each impacted site. The highest level of potentially contaminated media at each of the 23 impacted sites is presented below.

- High – 4 sites (Building 5, IR Site 1, IR Site 2, RadShack Area)
- Moderate – 1 site (Seaplane Lagoon)
- Low – 10 sites (Buildings 44, 66, 113, 114, 309, 346, 353, and 400, Smelter, Storm and Sanitary Drains)
- None – 8 sites (Buildings 7, 12, 42, 310, 497, Pier 3, Seaplane Ramp and Parking Apron, Alameda Annex)

The categories of high, moderate, low, and none were also used to assess potential migration pathways for any radioactive contamination at each impacted site. The highest level of migration pathways assessed at each of the 23 impacted sites is presented below.

- High – 0 sites
- Moderate – 2 sites (Building 5, Seaplane Lagoon)
- Low – 7 sites (353, 400, IR Site 1, IR Site 2, RadShack Area, Smelter, Storm and Sanitary Drains)
- None – 14 sites (Buildings 7, 12, 42, 44, 66, 113, 114, 309, 310, 346, 497, Pier 3, Seaplane Ramp and Parking Apron, Alameda Annex)

The categories of Emergency Action, Scoping Survey, Characterization Survey, Remediation, Final Status Survey, Free Release, and No Further Action were used to recommend future actions at each of the impacted sites. The recommended actions for each of the 23

impacted sites are presented below. (Buildings 5, 66 and 400 each have more than one recommended action based on the building history).

Emergency Action – 0 sites

Scoping Survey – 2 sites (Building 5 mezzanine exhaust ducting, former smelter location)

Characterization Survey – 6 sites (Building 44, Building 66 [main floor], Building 113, Building 114, Building 309, Building 400 exhaust ducting)

Remediation – 7 sites (Building 5 drain piping, Building 400 drain piping, IR Site 1, IR Site 2, RadShack Area, Seaplane Lagoon, Storm Drain System and Sanitary Drain System)

Final Status Survey – 4 sites (Building 5 mezzanine, Building 346, Bunker 353, Building 400 2nd floor.)

Free Release Pending Review of Characterization or Final Status Survey Report – 6 sites (Buildings 7, 66 Ignition Shop, 310, Bunker 497, Pier 3, Seaplane Ramp and Parking Apron)

No Further Action – 3 sites (Hangar 12, Building 42, Alameda Annex)

9.3 OVERALL CONCLUSIONS

Using the above criteria, the NAS Alameda HRA, Volume II concludes that of the 23 impacted sites identified:

- The potential for residual radioactive contamination exists and needs to be addressed at 15 of the 23 impacted sites (Buildings 5, 44, 66 Main Floor, 113, 114, 309, 346, 353, 400, IR Site 1, IR Site 2, RadShack Area, Seaplane Lagoon, Smelter, Storm Drain System and Sanitary Drain System)
- Six of the 23 impacted sites have been surveyed and found to be free of radioactivity. Final Navy and regulatory agency review of the surveys is required (Buildings 7, 66 Ignition Shop, 310, 497, Pier 3, Seaplane Ramp and Parking Apron)
- Two of the 23 impacted sites have been surveyed and found to be free of radioactivity. These sites have been released by RASO and CDHS (Hangar 12, Alameda Annex)
- One site not surveyed has only a history of use of a sealed source with no evidence of leakage and does not require a survey (Building 42)

- To date, no historical information about radiological operations or previous radiological investigations at any of the impacted sites presents a level of concern that would require any Emergency Action
- To date, high-level contamination has not been found at the site nor is the potential considered a possibility by the HRA
- To date, 3 impacted sites require restricted access due to known levels of undisturbed radioactive contamination (IR Site 1, IR Site 2, RadShack Area)
- To date, no evidence for potential airborne contamination has been found
- To date, potential pathways for contamination migration remain within the impacted site areas. No pathway has been identified for contamination to migrate off the former NAS site

The overall conclusion of the NAS Alameda HRA, Volume II is, even though there is potential residual radioactive contamination at 16 of the 23 impacted sites, the contamination, if any, is expected to be at low levels within the confines of each site on former NAS. The 16 impacted sites for which further action is recommended are:

1. Building 5 (mezzanine radium dial painting facilities drains from radium dial painting facilities, ventilation exhaust ducting from radium dial painting facility), possible disassembly and decontamination of aircraft engines.
2. Building 44 (bench test of radium dial and gauges)
3. Building 66 main floor (possible disassembly and decontamination of jet engines)
4. Building 113 (possible disassembly and decontamination of jet engines)
5. Building 114 (temporary storage of radioactively contaminated pipe)
6. Building 309 (temporary storage of DU)
7. Building 346 (storage building for radioactive waste)
8. Building 353 (temporary storage for radioactive anomalies)

9. Building 400 (second floor radium painting facility, drain piping from radium painting facility, DU storage room), (third floor storage of spark gap irradiators)
10. IR Site 1 (Station disposal area 1943 to 1956)
11. IR Site 2 (Station landfill 1956 to 1978)
12. RadShack Area (radioactive waste storage area at IR Site 2)
13. Seaplane Lagoon (storm drain discharge)
14. Seaplane Ramp and Parking Apron (possible Ra-226 spills from Building 400)
15. Smelter (possible melting of components containing radium)
16. Storm Drain and Sanitary Drain (associated with Buildings 5 and 400)

Recommendations have been made (see Section 8) to assess the identified areas of potential residual radioactive contamination and address its removal. The review of previous radiological activities, cleanup actions, and release surveys has not identified any imminent threat or substantial risk to human health or the environment of former NAS or the local community.

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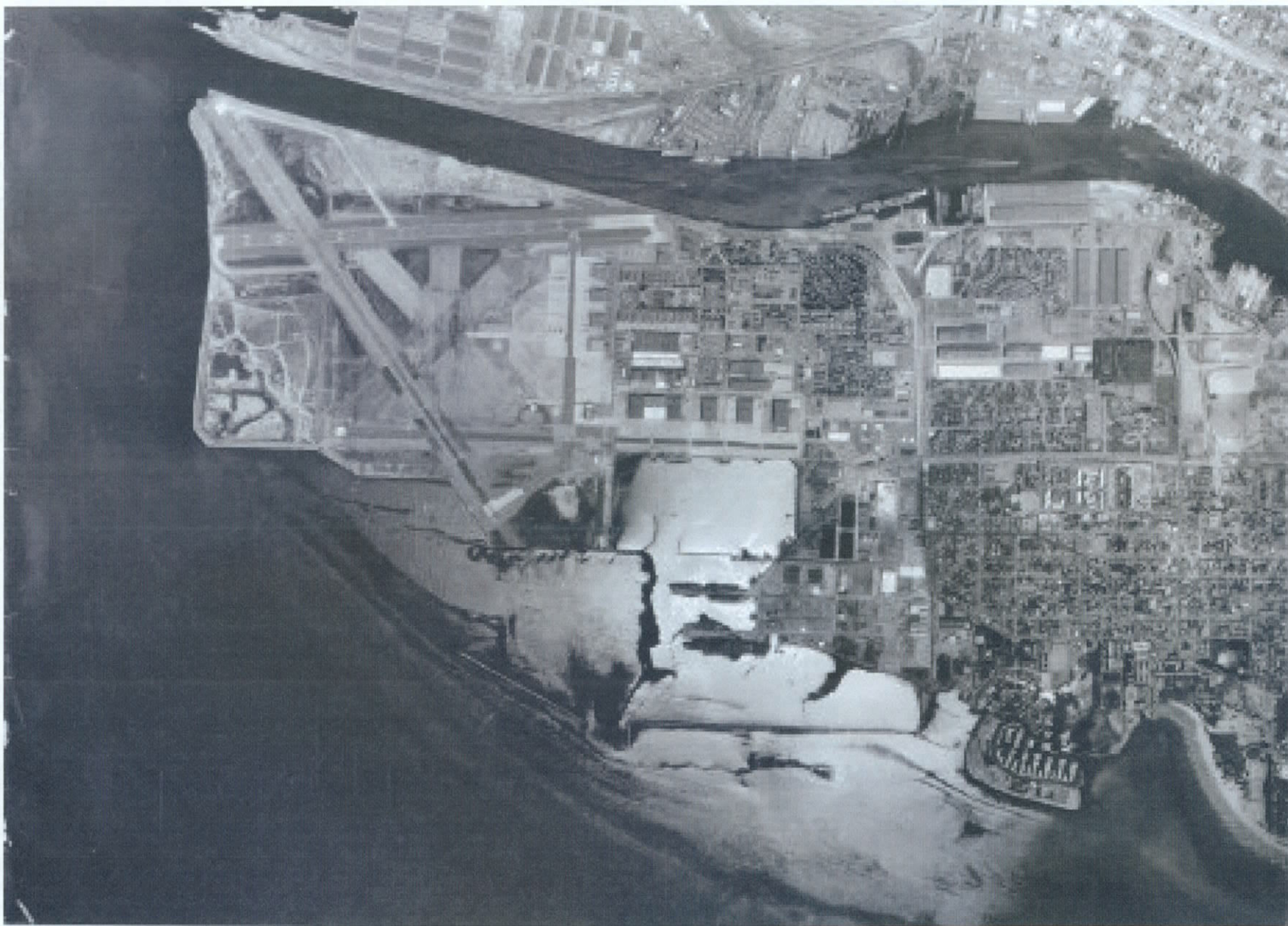
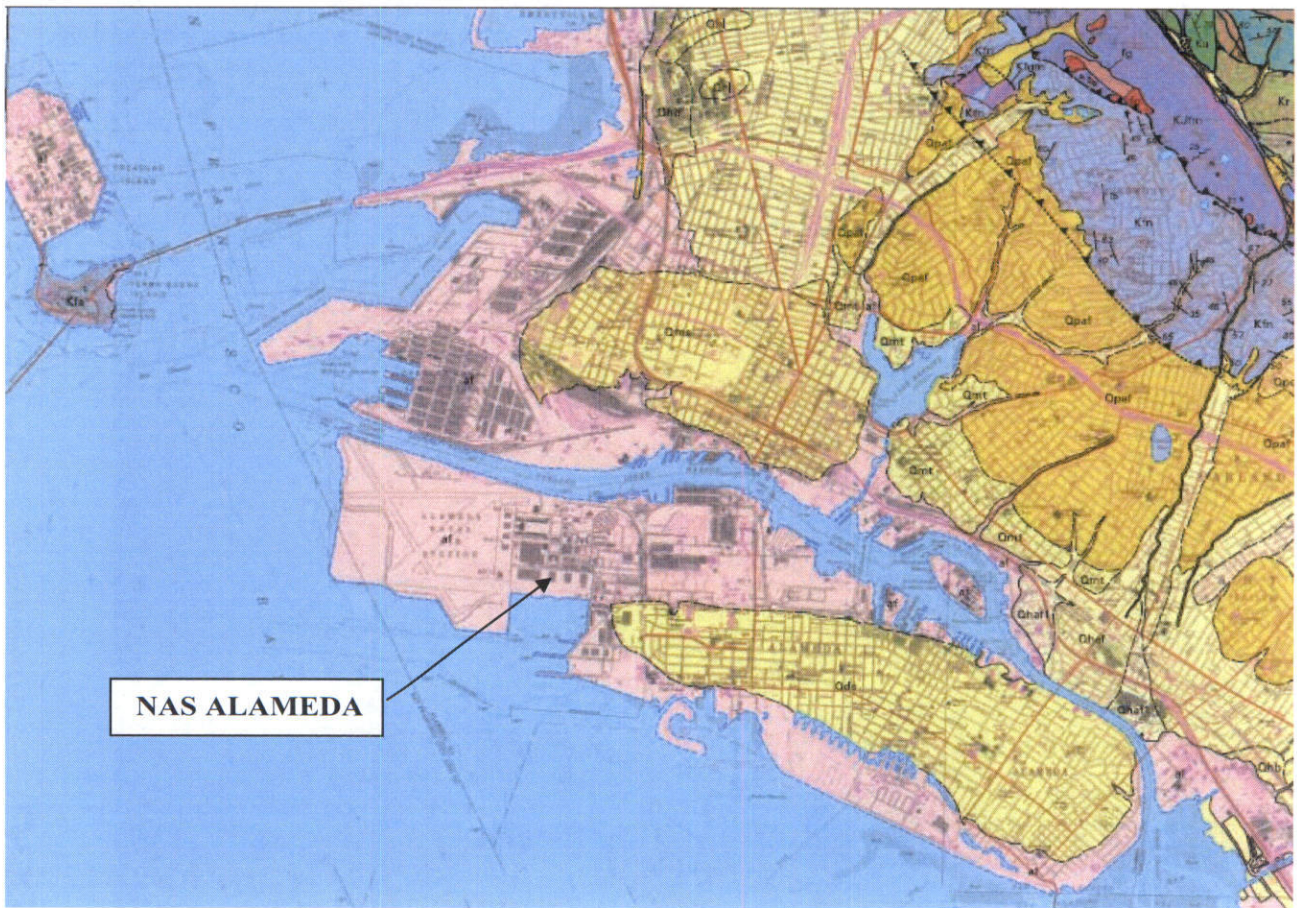


FIGURE A-9



750 Dump Road
Mare Island
Vallejo, California
94592

SITE PHOTO OF ALAMEDA
1985



NAS ALAMEDA

LEGEND

Alameda Island Original Land Mass:

YELLOW

Alameda Island Artificial Fill Area:

PINK

FIGURE A-10

Historical Radiological Assessment
Volume II

Former Naval Air Station Alameda
Alameda, CA

Appendix B

**Former
Naval Air Station Alameda
Interviews**

APPENDIX B

INTERVIEWS

B.1 GENERAL

Archival research conducted during preparation of the former NAS Alameda HRA, Volume II was intended to be augmented by contacts with people who had specific knowledge of radiological operations at former NAS.

To make contact with these people, the Navy posted a newspaper advertisement looking for personnel with knowledge of radiological operations at former NAS. The following advertisement was published in The San Francisco Chronicle, The San Francisco Examiner, The Independent, The Boutique and Villager, The San Mateo Weekly, The Foster City Progress, The Enquirer Bulletin, The Redwood City Tribune, The Oakland Tribune, The Alameda Times Star, The Daily Review, and The TriValley Herald. The advertisements ran for two consecutive Sundays; March 6 and March 13, 2005. The ads requested anyone with knowledge of radiological operations on former NAS to call in to a 1-800 phone number. The Restoration Advisory Board meeting of February 3, 2005 included a briefing of attendees on the HRA process. The BRAC Environmental Coordinator requested RAB members to spread the word about the opportunity for interviews. No responses were forthcoming from the advertisements.

ALAMEDA POINT/ALAMEDA NAVAL AIR STATION **SEEKING INFORMATION** **FOR HISTORICAL RADIOLOGICAL ASSESSMENT**

The Department of the Navy (Navy) is presently seeking to interview current and former Navy personnel, civilian employees, and contractors regarding radiological operations at the former Alameda Naval Air Station, Alameda, California. The Base Realignment and Closure Program Management Office West is working with the Naval Facilities Engineering Command, Southwest Division and the Navy's Radiological Affairs Support Office in the preparation of the Historical Radiological Assessment (HRA) for Alameda Naval Air Station. The HRA will document the historical radiological operations of the Naval Air Station including former uses of radioactive materials and locations where radioactive materials were used, stored, or disposed. Radiological operations may have been conducted by any of the following employers or their contractors: Alameda Naval Air Station, Naval Air Rework Facility, Fleet Industrial Supply Center Oakland (FISCO) Alameda Annex, or Naval Radiological Defense Laboratory.

Face-to-face interviews as well as telephone or e-mail interviews can be arranged.

Information resulting from interviews will be used for preparation of the HRA. The Navy is interested in obtaining open and honest oral histories. The Navy is not interested in pursuing adverse action against interviewees based on information supplied during the interviews. **If you are a current or former member of the Navy, former civilian employee, or contractor and have information about past radiological operations at ALAMEDA NAVAL AIR**

STATION, please contact Robert O'Brien, Weston Solutions, at e-mail address robert.obrien@westonsolutions.com or call 1-800-538-9815.

B.2 INDIVIDUAL INTERVIEWS

Three individual interviews of former NAS employees were recorded. None of the three individuals had any direct knowledge of radiological operations on former NAS.

Marilyn York

Ms. York is currently Director of Operations of the Alameda Naval Air Museum. She has a long association with the NAS. In 1942, she wanted to become a stewardess but learned that she needed to be a registered nurse to qualify to be a stewardess. She then joined the Navy and was sent to a Navy Technical Training Center in Norman, Oklahoma where she was trained to be an aviation machinist mate. She was assigned to be the driver for the first commanding officer of former NAS, Captain McCrary. After driving for him for a few years, she was assigned to be the driver for the nurse stationed in Building 5. In this capacity, she was assisting in investigating sick leave by the NAS employees. After leaving the Navy in 1946, Ms. York returned to NAS as a civilian worker. Her principal work area was in Building 66 overhauling fuel pumps. Ms. York retired from civilian service in 1976. She stated she had no specific knowledge of the use or disposal of radioactive materials. She was however, certain that until 1967, all liquid wastes generated on NAS were disposed of in the Seaplane Lagoon.

Douglas DeLong

Mr. DeLong is currently the Caretaker Site Manager for former NAS. He began employment at NAS in 1972. He had several job assignments over the years. His first assignment was as an Aircraft Electrician. He also worked as a Plant Maintenance electrician, a Tool shop foreman, a Civil Engineer, Environmental Protection Office worker, and finally the Caretaker for the closed NAS. Mr. DeLong had no specific knowledge of the uses of or disposal of radioactive materials until after the NAS was closed and he became aware by virtue of his work as the Caretaker Site Manager. He stated that as an electrician, he had occasion to be in many buildings including Building 5 where he was required to go into crawl spaces and ceiling areas. Over the years, he also had a desk in the mezzanine area of Building 5 and in Building 346 but was not aware of any radioactive materials. Mr. DeLong noted that there were x-ray machines in Building 5 and that the operators required dosimeters. Additionally, dosimeters were required in the medical clinic and by some of the Safety Technicians when using various equipments. Mr. DeLong noted that there was a rumor about a locked vault in either B-168 or 169 that was used to store "radiological items for short periods of time". He has not been able to verify that rumor during his time as Caretaker Site Manager.

William Featherston

Mr. Featherston, currently retired, was an environmental engineer on Alameda NAS from 1984 to 1996. He reported that in the late 1990's some of the piping in the paint shop (in Building 5) was found to be radioactive. He initiated action to bring in radiation surveyors to perform more detailed surveys. Based on the surveys, some of the radioactive piping was removed but other drain piping in the building and outside the building remained and was radioactive. He was not aware of other uses of Building 5 or other buildings for radioactive material purposes.

Historical Radiological Assessment Volume II

Former Naval Air Station Alameda
Alameda, CA

Appendix C

REFERENCES

(Provided on compact disc)

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Historical Radiological Assessment
Volume II
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Appendix D

Response to Comments
For
Draft Historical Radiological Assessment
Report
Alameda Point, California

**Response to Comments
For
Draft Historical Radiological Assessment Report, Alameda Point, California**

**Comments submitted by California Department of Health Services (CDHS)
dated December 21, 2006**

General Comments:

1. No General Comments at this time.

Specific Comments:

Comment 1: Section 4.4.2.2, "Archive Information", pages 4-8 and 4-9;

This section provides information about Disposal Areas IR Sites 1 and 2 receiving "essentially all waste generated on the former NAS" (Naval Air Station) during the years the NAS was in operation. The Navy may want to include additional information about the disposal practices related to radioactive wastes generated by the Naval Air Rework Facility (NARF) while it was in operation from 1967 to 1987 and by the Naval Air Depot (NAD) while it was in operation from 1987 to 1996.

Response:

Section 4.4.2.2 indicates that essentially all waste generated during the periods from 1943 to 1956 and 1956 to 1978 was disposed of in disposal areas IR Sites 1 and 2. The section does not specify where wastes were disposed after IR Site 2 was closed in 1978.

Disposal of non-radiological waste is beyond the scope of the HRA. Disposal of radioactive waste after the closure of the IR Site 2 disposal area was via commercial contractor to commercial radioactive waste disposal sites. Well before the closure of IR Site 2, there is evidence that radioactive waste was disposed of by commercial contractors at licensed disposal facilities. The RASO Report of Technical Assistance visit of March 1973 specifically discusses the storage of radioactive waste in a locked fenced-in area (Radshack Area) until pickup by a 'licensed radioactive waste disposal firm'. The 1977 RASO Report of Technical Assistance visit notes that the arrangements for disposal of radioactive waste were made by the Navy Regional Medical Center Industrial Medical Facility through the Naval Supply Center Oakland.

The second paragraph of Section 4.4.2.2 has been revised to add a last sentence which reads:
“As early as 1973, the radioactive wastes generated were being disposed of by licensed radioactive waste disposal firms at approved disposal facilities (ALA-HRA 37, 38).”

The third paragraph of Section 6.1.1.3 has been revised as follows to clarify the offsite disposal of radioactive waste:

“Installation Restoration Site 2 is also called the West Beach Landfill (Figure 6-11). This landfill received *essentially* all wastes generated by former NAS from 1956 to 1978. *As early as 1973, the radioactive wastes generated by NAS, NARF, and NADEP were being disposed of by licensed radioactive waste disposal firms at approved disposal facilities (ALA-HRA 37, 38).* The landfill area isdiscussed in Section 6.2.10.”

Section 8.3.16 has been revised as follows:

“Installation Restoration Site 2 is also called the West Beach Landfill. This landfill received *essentially* all wastes generated by former NAS from 1956 to 1978. *As early as 1973, the radioactive wastes generated by NAS, NARF, and NADEP were being disposed of by licensed radioactive waste disposal firms at approved disposal facilities (ALA-HRA-37, 38).* The landfill area isprovides a site plan.”

Comment 2: Section 8.3.15, “Installation Restoration Site 1”, page 8-49;

Eight (8) radionuclides are mentioned in the “Potential Radionuclides of Concern” subsection. Only two (2) radionuclides (Ra-226 and Sr-90) are addressed in the subsequent “Previous Radiological Investigations” subsection. When and how were the remaining six (6) potential radionuclides of concern investigated at IR Site #1?

Response:

As noted in Section 6.0, in addition to radium (the main source of radioactive contamination), several other sources of radioactivity such as DU and various electronics containing sealed sources were identified. The eight potential radionuclides of concern discussed in Section 6 and listed in Section 8.3.15 are Ra-226 (Section 6.1.1.3), Cs-137 (Section 6.1.3), Sr-90 (Section 6.1.1.3), DU (Section 6.1.2), UO₂ (Section 6.1.3), Th-232 (Section 6.1.1.3), Kr-85 (Section 6.1.3), and Co-60 (Section 6.1.3). Only two radionuclides (Ra-226 and Sr-90) were specifically identified by surveys in IR Site 1. Based on the use of the disposal area, it is clearly possible that one or more of the other six radionuclides could have been disposed in IR Site 1. Any future surveys of the IR Site 1 should include analyses for the other radionuclides. Note that Kr-85 is a gas and is therefore not likely to be present.

To date, no surveys have been performed for radionuclides other than Ra-226 and Sr-90; therefore no change is recommended for Section 8.3.15.

Comment 3: Section 8.3.16, "Installation Restoration Site #2", page 8-52;

Please reference Specific Comment #2 and substitute "IR Site #1" with "IR Site #2".

Response:

As noted in Section 6.0, in addition to radium (the main source of radioactive contamination), several other sources of radioactivity such as DU and various electronics containing sealed sources were identified. The eight potential radionuclides of concern discussed in Section 6 and listed in Section 8.3.15 are Ra-226 (Section 6.1.1.3), Cs-137 (Section 6.1.3), Sr-90 (Section 6.1.1.3), DU (Section 6.1.2), UO₂ (Section 6.1.3), Th-232 (Section 6.1.1.3), Kr-85 (Section 6.1.3), and C0-60 (Section 6.1.3). Only three radionuclides (Ra-226, Sr-90, and Th-232) were specifically identified by surveys in IR Site 2. Based on the use of the disposal area, it is clearly possible that one or more of the other five radionuclides could have been disposed in IR Site 2. Any future surveys of the IR Site 2 should include analyses for the other radionuclides. Note that Kr-85 is a gas and is therefore not likely to be present.

To date, no surveys have been performed for radionuclides other than Ra-226, Sr-90, and Th-232; therefore no change is recommended for Section 8.3.16.

Comment 4: Sections 8.3.15 and 8.3.16;

Both of these sections do not address the lack of radiological surveys of the shoreline and rip-rap areas for IR #1 and #2.

Response:

It is understood that there are areas along the shoreline and in the rip-rap sites where surveys were not feasible. The majority of the high-density surveys were conducted with multiple detectors. Areas along the shoreline too rough for ATV or tractor pulled trailers with detectors were surveyed using a single hand-held detector. Those areas immediately adjacent to the shoreline and areas of the rip-rap not suitable for an individual to walk on were not surveyed. The HRA has been revised to recognize this fact as follows:

Section 6.2.9, Section 6.2.10, Section 8.3.15 Previous Radiological Investigations and Section 8.3.16 Previous Radiological Investigations were changed by adding:

"Some areas immediately adjacent to the shoreline and in rip-rap concentrations were not accessible even for an individual carrying a single hand-held detector and therefore were not surveyed."

Comment 5: Section 8.3.17, "Radshack Area", page 8-57;

The Navy may want to describe the radiological survey methods for Cs-137 and Th-232 and address the results of the survey within this section.

Response:

The surveys conducted in the Radshack area identified components containing Ra-226 and deck markers containing Sr-90. The other two potential radionuclides of concern (Cs-137 and Th-232) were not identified by survey. It is known that optical glass prisms (Th-232) were stored in the Radshack pending shipment. In addition, there were reports of high levels of loose beta-gamma contamination in the ignition shop of Building 66. Spark gap irradiators containing Cs-137 (beta-gamma emitter) were worked on in Building 66. Since waste from Building 66 and other buildings was stored in the Radshack, surveys for Th-232 and Cs-137 would be appropriate.

No surveys were conducted in the Radshack area for Th-232 and Cs-137; therefore no change is recommended for Section 8.3.17.

Comment 6: Section 8.3.21, "Smelter", page 8-71;

CDHS concurs with the "Recommended Action" for a Scoping Survey of the surface soil, storm drains and sanitary drains within the immediate area that may be affected by past smelter operations. Since no history of smelter use has been found by the Navy, the Scoping Survey should be accomplished to provide relevant data for all Alameda Naval Air Station's potential radionuclides of concern, unless the Navy can provide reasoning and information that may reduce the number of radionuclides of concern to be surveyed for.

Response:

The Navy agrees that the Scoping Survey recommended for the Smelter should cover any radionuclides expected to result from smelting operations. There are 12 radionuclides of concern listed on Table 4-3. Of those 12, 6 radionuclides would not be expected to be found in the smelter for the reasons listed below:

- H-3 (tritium) found in exit signs and associated with nuclear weapons. Tritium exit signs were not in common use until after the smelter had been demolished (earlier than 1954). Nuclear weapons would not have been melted down in the smelter.
- Kr-85 (krypton) is found in vacuum tubes and spark gap irradiators. Kr-85 is a gas and therefore would not be present 50 years after the smelter was demolished.
- Ni-63 (nickel) was used only in the gas chromatograph in Buildings 42 and 7. The first use of the gas chromatograph was not until 1981, well after the smelter was demolished.
- Th-232 (thorium) was used in optical glass. Since the smelter was probably used to reduce the volume of the waste processed, it is not likely that the optical glass would have been processed through the smelter.
- U-235 (enriched uranium) is associated with nuclear weapons. Nuclear weapons would not have been melted down in the smelter.

- U-238 (depleted uranium) is found in aircraft counterweights. Defective counterweights were returned to the navy supply system and would not have been sent to the smelter.

Section 8.3.21 Potential Radionuclides of Concern has been revised to include five additional radionuclides as follows: *Co-60, Cs-137, Pu-239, Sr-90, and UO₂*.

Comments submitted by the San Francisco Bay Water Board dated December 7, 2006

Comment S-1, Page 1-9, Section 1.6:

Conclusions – This paragraph concludes that low levels of radioactive contamination exist at the former Naval Air Station, with no imminent threat or substantial risk to tenants of former NAS or the local community. Is there any current unacceptable risk posed from the sites identified in Section 8 of this assessment where contamination and/or potential migration pathways were identified. Also, while this assessment only covers activities through 2005, it may be appropriate to briefly describe the ongoing Time Critical Removal Action (TCRA) at Sites 1, 2, and 32. Sites 1 and 2 seem to have the highest identified contamination levels, which were high enough to initiate the TCRA.

Response:

The recommended actions sections are designed to take the actions needed to achieve compliance with applicable site release criteria. There are no sites with levels of contamination that pose an ‘unacceptable risk’.

With regard to current ongoing actions such as the TCRA at Sites 1, 2, and 32, it would not be appropriate to discuss them in any detail in an historical document.

The following sentence has been added to the end of Section 6.2.9:

“A Time Critical Removal Action is in progress in Site 1 to accomplish the removal of radium anomalies, radium contaminated soil and material potentially presenting an explosive hazard.”

The following sentence has been added to the end of Section 6.2.10:

“A Time Critical Removal Action is in progress in Site 2 to accomplish the removal of radium anomalies, radium contaminated soil and material potentially presenting an explosive hazard.”

Comment S-2, Figure 3-2:

Why are only Site 1, Site 2, Seaplane Lagoon, and Pier 3 labeled on this figure? Please either remove these labels or label all the sites associated with this Draft HRA. Also, the diagram for the Alameda Annex in the top right of the figure is out of place. Please include Alameda Annex on the map.

Response:

Figure 3-2 has been revised by removing the labels as suggested. All radiological assessment sites are labeled on Figure 4-1. Both Figures 3-2 and 4-1 were changed to show the actual

location of the Alameda Annex DRMO Scrapyard. An enlarged view of the Scrapyard will remain to provide details of the Annex.

Comment S-3, Page 3-9, Section 3.4.2:

Groundwater – second paragraph from the top – This paragraph indicates that no groundwater is used for water supply on Alameda Island, and a 1983 reference is used to describe groundwater use. Please include more current information describing the use of groundwater on Alameda Island and clearly distinguish between municipal water wells and individual extraction of groundwater.

Response:

The January 2006 Lamphier-Gregory *Northern Waterfront Amendment* for Alameda Island indicates that overpumping of water wells on Alameda Island resulted in saltwater intrusion to the extent that most wells were closed by 1900. Only minor pumping of groundwater from the aquifer underlying Alameda Island has occurred since 1900 (ALA-HRA-XX). The Defense Environmental Restoration Program Annual Report to Congress for Fiscal Year 1995 states “the majority of water beneath the installation is too salty to ever be used for drinking water.” (ALA-HRA-YY). The last paragraph of Section 3.4.2. has been revised to read as follows:

“Former NAS is underlain by a thick aquitard sequence of the bay mud formation, which is a silty clay. The underlying formations contain some sand units that have served as aquifers in the past. *The January 2006 Lamphier-Gregory Northern Waterfront Amendment for Alameda Island indicates that overpumping of water wells on Alameda Island resulted in saltwater intrusion to the extent that most wells were closed by 1900. Only minor pumping of groundwater from the aquifer underlying Alameda Island has occurred since that time (ALA-HRA-XX). The Navy has taken the position that the majority of water beneath Alameda NAS is too salty to ever be used for drinking water (ALA-HRA-YY).* Furthermore, according to the East Bay Municipal Utility District (EBMUD), no groundwater wells are used for drinking water supply on Alameda Island (ALA-HRA-5) but are known to be used for backyard gardening and/or landscape irrigation.”

Comment S-4, Page 3-12, Section 3.8:

Environmentally Sensitive Areas – first paragraph, last sentence – A 1983 reference is used to claim that there are no known endangered, rare or threatened plant species inhabiting Alameda Point. Also, the top paragraph on Page 3-13 that discusses rare or endangered animal species uses the same 1983 reference. Please include more current documentation to describe the environmentally sensitive species inhabiting or potentially inhabiting Alameda Point.

Response:

The last sentence of the first paragraph of Section 3.8 has been revised to read as follows:

“Review of December 1998 Draft Comprehensive Conservation Plan for the Alameda National Wildlife Refuge (ALA-HRA-) indicates that none of the approximately 20 species of vegetation observed on former NAS are found in the listing of USFWS Threatened and Endangered Species System (ALA-HRA-TESS).”

The paragraph at the top of page 3-13 has been revised to read as follows:

“...the exposed rock and limited mud areas, feeding on worms, crustaceans, mollusks, and smaller fish. The two wetlands located on the west end of the island provide the largest nesting and breeding grounds in northern California for the endangered California least tern (ALA-HRA-5). *Other endangered or threatened species which have been observed on former NAS are the western snowy plover (threatened), the American peregrine falcon (proposed for de-listing), and the stellar sea lion (endangered – not observed in recent years) (ALA-HRA-Draft Comp. Cons Plan).* In addition, the endangered brown pelican roosts on the island breakwater. There are no other rare or endangered animal species with habitats at former NAS (ALA-HRA-5).”

Comment S-5, Page 5-11, Section 5.7.3:

Regional Water Quality Control Board – Please refer to us as the San Francisco Bay Water Board, or Water Board, throughout this document instead of Regional Water Quality Control Board, or RWQCB. Also ensure any references to our website reflects the new address: <http://www.waterboards.ca.gov/sanfranciscobay/>

Response:

All references to the Regional Water Quality Control Board or to the RWQCB are being replaced with San Francisco Bay Water Board on first use and simply Water Board thereafter. The changes are being made to: the Table of Contents (Section 5.7.3), the List of Abbreviations (deleting the RWQCB), and Section 5.7.3.

Comment S-6, Page 8-64, Section 8.3.19:

Seaplane Lagoon Recommended Actions: - The Draft HRA recommends a comprehensive sampling and cleanup plan for the lagoon, whereas the Site 17 ROD, dated 10/2/06, stated on page 5-4 that based on the data, “the RI concluded that there was no unacceptable risk to human health or the environment associated with radium in sediments.” Please address this discrepancy.

Response:

As discussed in response to comment S-1, there are no sites that pose an unacceptable risk to human health or the environment. The proposed plan for the Seaplane Lagoon recommends dredging the northeast and northwest corners of the lagoon to remove all contaminants, including radionuclides, to a depth of 4 feet. While the dredging agreed to in the Site 17 ROD and the sampling after dredging also contained in the ROD are specifically aimed at

removal of PCBs, the ROD will result in removal of the radium concentrations necessary to achieve release of the Seaplane Lagoon.

Because radionuclides do not pose an unacceptable risk to human health, no change is recommended to the HRA.

Comments Submitted by the Human and Ecological Risk Division (HERD) of the Department of Toxic Substances Control dated January 17, 2007

GENERAL COMMENTS

HERD review of this document was performed to determine the application of the information contained to the Installation Restoration Program (IRP) reviews performed by HERD for other IRP sites or facilities.

SPECIFIC COMMENTS

Comment 1: HERD has reviewed none of the additional documents referenced in this HRA and defers to the California Department of Health Services (DHS) regarding the use of discrete radioactive sources at Naval Air Station Alameda (NASA). The Navy agrees to seek DHS concurrence for any radiological free release of property described in this document (Section 5.7.1, page 5-11). This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractor.

Response:

No Response required.

Comment 2: The statement regarding use of groundwater on Alameda Island (Section 3.4.2, page 3-9) should be amended to indicate that groundwater wells are not used for domestic drinking water supply, but are known to be used for backyard gardening and/or landscape irrigation.

Response:

The last sentence of Section 3.4.2 has been revised to read: "Furthermore, according to the East Bay Municipal Utility District (EBMUD), no groundwater wells are used for drinking water supply on Alameda Island (ALA-HRA-5) but are known to be used for backyard gardening and/or landscape irrigation."

Comment 3: The statement regarding the use of the vicinity of NASA by rare or endangered fish (Section 3.8, page 3-13) should be amended to indicate that 'none of the rare or endangered fish species in San Francisco Bay reside for extended periods of time or breed in proximity to former NAS' by including the underlined text.

Response:

The last sentence of Section 3.8 has been revised to read:

“Based on the information listed above, none of the rare or endangered fish species in San Francisco Bay reside *for extended periods of time or breed* in proximity to former NAS (ALA-HRA-5).”

Comment 4: HERD concurs with the list of the radiological assessments which are currently required (Section 4.4.3.2, page 4-10) based on the information provided in this document. This comment is intended for the DTSC Project Manager and no response is required from the Navy or Navy contractor.

Response:

No Response required.

Comment 5: HERD wishes to obtain a copy of several of the photographs (Figure 6-3, page 6-3, Figure A-3, Figure A-4, Figure A-5, Figure A-6) indicating the location of the Old Alameda Airport and the San Francisco Bay Aerodrome and fill history of NASA to aid in the review of IRP sites. Please forward contact information to James Polisini at 818-551-2853 or jpolisin@dtsc.ca.gov.

Response:

A compact disc containing the requested photographs has been forwarded to HERD by the HRA contractor, Weston Solutions Inc.

Comment 6: Based on the information summarized, Building 5 (Section 6.1.1.1, page 6-5), Building 400 (Section 6.1.1, page 6-11), IR Site 1 (Section 6.1.1, page 6-14 and Section 6.2.9, page 6-34), IR Site 2 and the RadShack Area (Section 6.1.1, page 6-16 and Section 6.2.11, page 6-35), the Seaplane Lagoon (Section 6.1.1, page 6-20 and Section 6.2.14, page 6-38), Building 310 (Section 6.1.1, page 6-21), Building 66 - Ignition Shop (Section 6.1.1, page 6-22) and the storm drain and sanitary systems associated with Buildings 5 and 400 (Section 6.2.13, page 6-37) are the most likely radiological locations requiring remediation for radiological clearance.

Response:

The Navy concurs with the summary except that Building 309 should be substituted for Building 310. Building 310 was decontaminated and surveyed in 1996. There is no indication that Building 309 was surveyed.

The above is provided for information and no change is recommended to the HRA.

Comment 7: The lack of data for the swipe survey of Building 400 (Section 6.2.7, page 6-33) is a data gap. Final Status Surveys are recommended for the radium paint areas of Building 400. This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractor.

Response:

No Response required.

Comment 8: The 1996 survey of the DRMO scrap yard of the Fleet Industrial Supply Center Alameda (FISCA) covered the outside areas of the scrap yard 'except where there were scrap piles preventing access to the grid location' (Section 6.2.16, page 6-39). The 2002 survey concentrated on the locations identified during the 1996 survey. This would appear to be a data gap for the former location of the scrap piles, however the FISCA DRMO scrap yard was cleared for release by DHS and DTSC in 2003 (Table 6-1, page 6-48; Section 8.3.23, page 8-77). This comment is meant for the DTSC Project Manager, and the FISCA HERD Toxicologist, and no response is required by the Navy or the Navy contractor.

Response:

No Response required.

Comment 9: The individual site descriptions and recommendations as described (Section 8.3, pages 8-1 through 8-78):

	Recommendation (Section 8.3)
Building 5	a. Remediation of drain pipes inside b. Scoping survey of ventilation system
Building 7	Free Release pending regulatory concurrence
Hangar 12	No Further Action
Building 42	No Further Action
Building 44	Characterization Survey
Building 66	a. Characterization Survey of Main Floor b. Free Release pending regulatory concurrence of Ignition Shop
Building 113	Characterization Survey
Building 114	Characterization Survey of floor area that may have been temporary storage for Building 5 piping.
Building 309	Characterization Survey
Building 310	Free Release pending regulatory concurrence
Building 346	Final Status Survey
Bunker 353	a. Remove temporarily stored radioactive material b. Final Status Survey
Bunker 497	Free Release pending regulatory concurrence
IR Site 1	Remediation based on 1998/1999 and 2004 high-density survey
IR Site 2	Remediation based on 1998/1999 and 2004 high-density survey
RadShack Area	Remediation based on 1998/1999 and 2004 high-density survey
Pier 3	Free Release pending regulatory concurrence
Seaplane Lagoon	Remediation
Seaplane Ramp	Free Release pending regulatory concurrence

Smelter	Scoping Survey at former location including storm drains and sanitary drains in the immediate area
Storm Drain System and Sanitary Drain System	Complete the remediation
Alameda Annex	No Further Action

The Seaplane Ramp and Parking Apron is included in the summary listing among the sites which need to be addressed due to potential for residual radioactive contamination (Section 9.3, page 9-4). However, the individual summary for the Seaplane Ramp and Parking Apron (Section 8.3.20, page 8-66) indicates 'Free Release pending concurrence' based on negative results in a 100 percent survey of suspect surfaces with a gamma scintillation counter. Please correct the recommendation or site summary (Section 9.3) so that they are correct and agree.

Response:

The Seaplane Ramp and Parking Apron recommended action in Section 8.3.20 is 'Free Release pending final Navy and regulatory agency review and concurrence.' This is the correct recommendation. Section 9.3 first and second bullets have been changed to relocate reference to the Seaplane Ramp and Parking Apron and read as follows:

- The potential for residual radioactive contamination exists and needs to be addressed at 15 of the 23 impacted sites (Buildings 5, 44, 66 Main Floor, 113, 114, 309, 346, 353, 400, IR Site 1, IR Site 2, Radshack Area, Seaplane Lagoon, Smelter, Storm Drain System and Sanitary Drain System)
- Six of the 23 impacted sites have been surveyed and found to be free of radioactivity. Final Navy and regulatory agency review of the surveys is required (Buildings 7, 66 Ignition Shop, 310, 497, Pier 3, *Seaplane Ramp and Parking Apron*)

CONCLUSIONS

Once the discrepancy regarding recommendations for the Seaplane Ramp and Parking Apron is corrected HERD supports the recommendations contained in this report.

Please forward a contact point or vendor for the Naval Air Station Alameda photographs listed in the Specific Comments.

Response:

A compact disc containing the requested photographs has been forwarded to HERD by the HRA contractor, Weston Solutions Inc.

Historical Radiological Assessment
Volume II
Former Naval Air Station Alameda
Alameda, CA

Appendix A

**Former NAS Alameda
Historic Drawings and Photographs**



FIGURE A-1



750 Dump Road
Mare Island
Vallejo, California
94592

SITE MAP OF ALAMEDA
1899

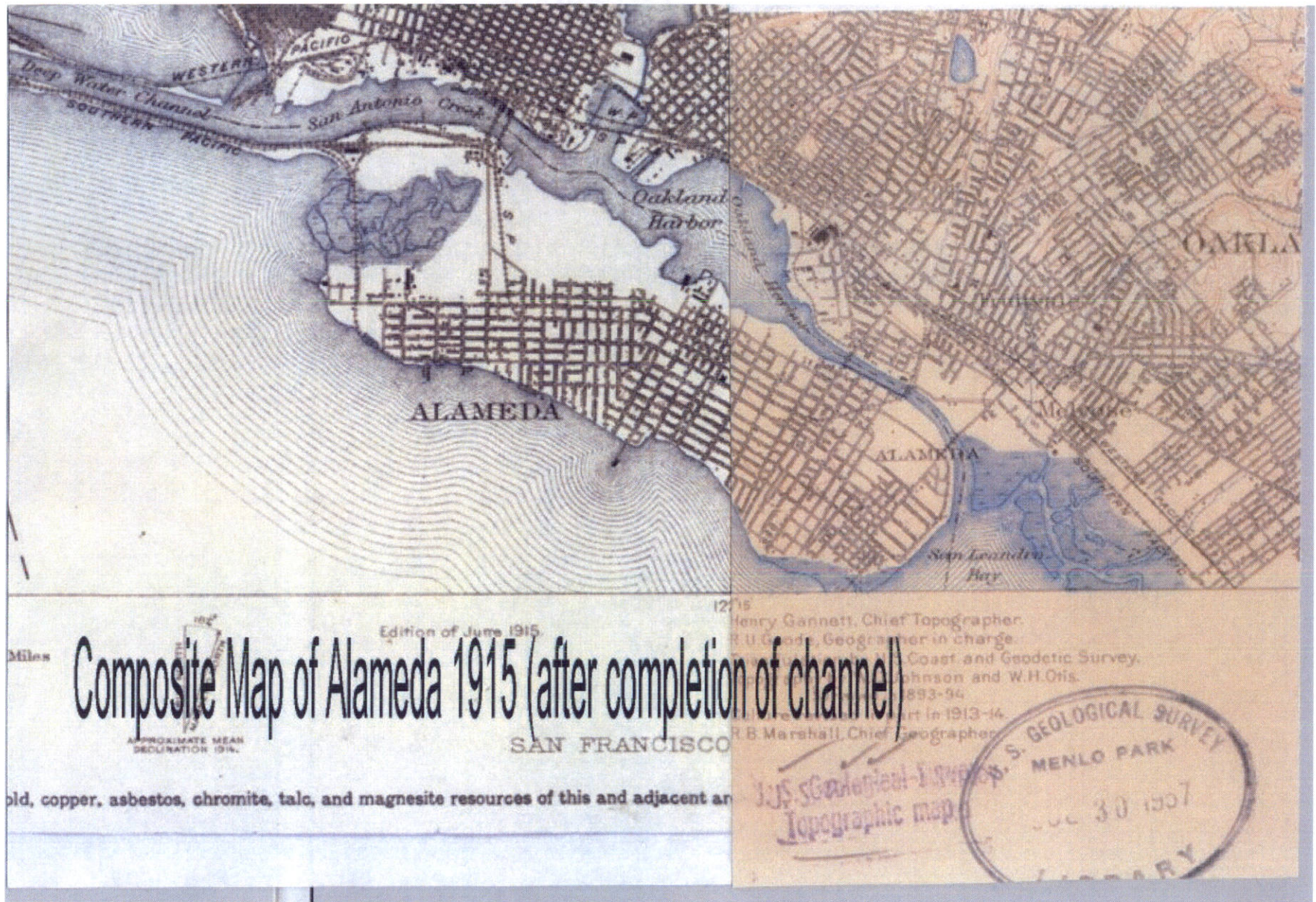


FIGURE A-2

No. 113



FIGURE A-3



750 Dump Road
Mare Island
Vallejo, California
94592

SITE PHOTO OF ALAMEDA
(Looking West)
1938



FIGURE A-4



750 Dump Road
Mare Island
Vallejo, California
94592

SITE PHOTO OF ALAMEDA
(Looking West)
1941

Looking west on 3 August, 1944



FIGURE A-5



750 Dump Road
Mare Island
Vallejo, California
94592

SITE PHOTO OF ALAMEDA
1944

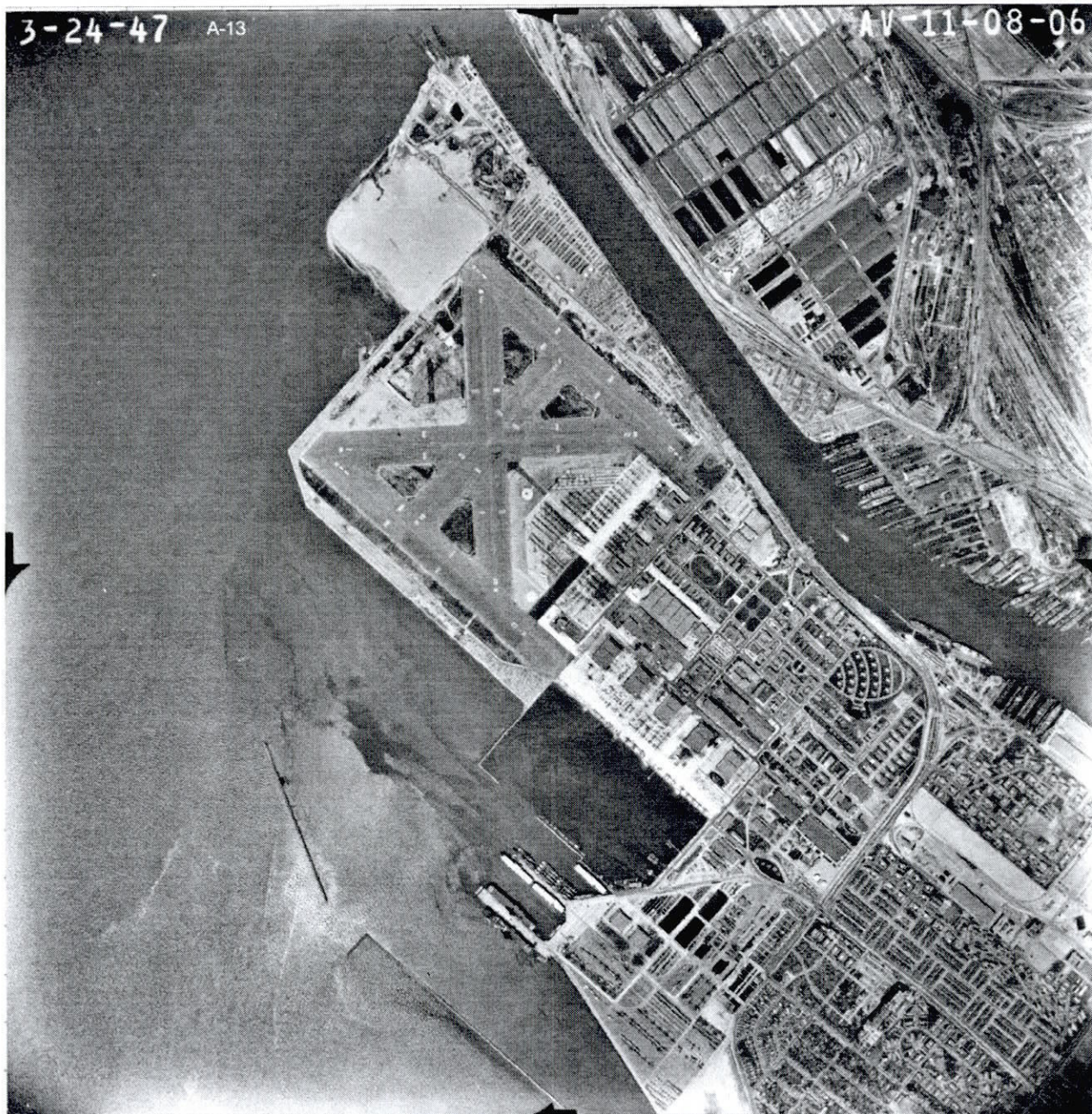


FIGURE A-6



750 Dump Road
Mare Island
Vallejo, California
94592

SITE PHOTO OF ALAMEDA
1947

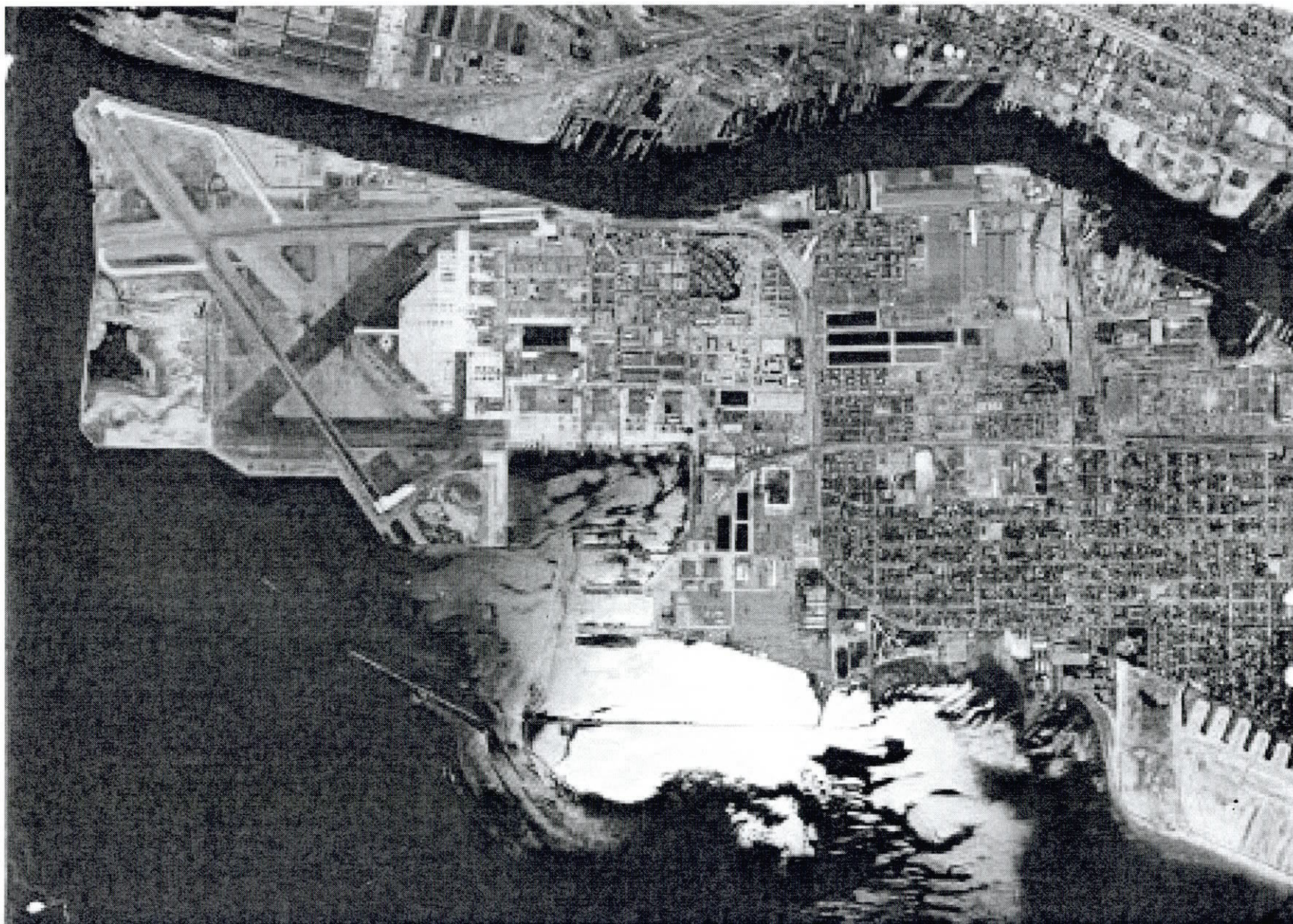


FIGURE A-7



750 Dump Road
Mare Island
Vallejo, California
94592

SITE PHOTO OF ALAMEDA
1963



FIGURE A-8



750 Dump Road
Mare Island
Vallejo, California
94592

SITE PHOTO OF ALAMEDA
1968